MiCloud Business Solution

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Mitel®

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Chapter 1

MICLOUD BUSINESS SOLUTION

OVERVIEW

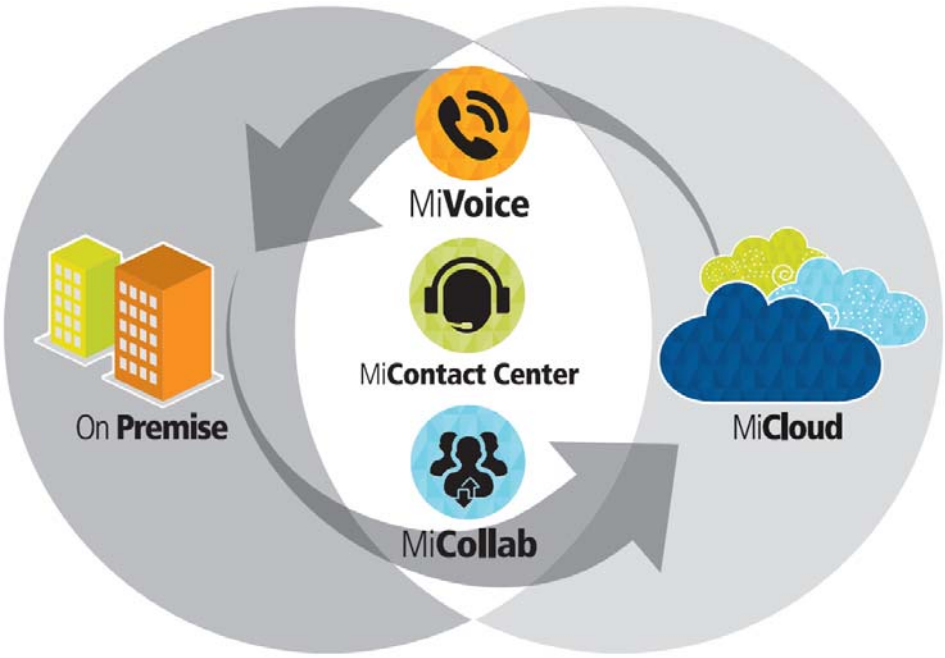
Introduction

MiCloud Business Solution is a Mitel unified communications (UC) solution built on the Mitel MiCollab and MiVoice Business platforms. The Mitel UC portfolio includes cloud and premise-based solutions for service providers and enterprises. Mitel UC solutions are easily adapted or scaled to match the changing demands and needs of the hosted market, the enterprise, and the end-user.

Selecting the most appropriate cloud or premise solution requires identifying all of the stakeholders involved in the delivery of the solution. A architecture can be selected after evaluating each stakeholder's requirements. The Mitel UC solution architecture offers customers the freedom to move between premise-based and cloud strategies as business priorities change.

Mitel solution architecture encompasses a full suite of Unified Communications and Contact Center solutions. This blueprint focuses on cloud solutions. For enterprise deployments, MiVoice Business-centric UC solutions are covered in the *Enterprise UC Solution Blueprint*.

Figure 1: Mitel Solution Architecture



Unified Communications

Unified communications (UC) is a term that implies the real-time integration of voice, data, and video communication. Without UC, a user's voice mail, e-mail, video conferencing, voice conferencing, chat, and desktop sharing applications are independent and require separate interaction.

A rich UC solution delivers a user experience that integrates all the user's communication tools into a unified experience. With a UC solution, a user can seamlessly choose the medium they

want to use without affecting the medium that other participants are using. For example, users may attend a meeting from different locations using a combination of text, voice, or video technologies without affecting other attendees. Combined with real-time presence, each participant knows what options they have for communicating with another participant. UC provides a user with a consistent unified experience across multiple devices and media-types.

Why deploy a cloud solution?

Use of a cloud solution improves employee productivity and consolidates infrastructure, but it is more than a telephony upgrade or a consolidation of applications. Cloud solutions cause evolution in how, when, where, and even what communication takes place in an organization.

The digital age has created a culture in which end-users are always “plugged in,” almost regardless of where they are. In a crisis, consumers are connected to multiple resources, requesting help and monitoring multiple communication channels for responses. Mining for information to solve a problem is not necessarily limited by time of day or location.

Cloud solutions provide the tools to respond immediately, with the most appropriate content, over the most effective channel. Remote conversations that begin with instant messaging or texting can switch to voice calls, exchanging electronic files, or even a conference call with other team members using video and voice. Coordinating presence, calendars, and geo-location can result in face-to-face meetings to find a resolution.

Cloud solutions affect the productivity of teams and employees. For example, they can enable:

- Increased mobility of the workforce, with the ability to continue to work with co-workers when they are not in the office.
- Capabilities that allow off-site personnel to handle bursts of business traffic without physically being present in the office.
- Working remotely to accommodate travel or personal issues such as school cancellations and home repairs.
- Individually tailored communications environment from any desk at head office, branch offices, or remote.

Cloud solution stakeholders

The flexible Mitel cloud solution architecture is an opportunity for organizations to specialize their offers and expertise, or widen their business models to operate in multiple capacities in one or more of the following roles:

- Service providers (SPs) maintain their own data center or purchase resources from a data center to offer hosted services. Service providers manage the applications and images. They engage end-customers directly, or wholesale service blocks to virtual service providers (VSPs). Service providers may also engage value added resellers (VARs) to sell their hosted solutions.
- Enterprise customers define their service requirements and choose between premise-based, private cloud, and shared cloud solutions. Enterprise customers are not resellers of their purchased UC services. When using a hosted solution, enterprise customers may perform some application management at the organizational level. Component ownership

does not prevent an enterprise from engaging service providers to manage their systems as a professional service.

- Value added resellers (VARs) act as agents to sell solutions bundled with their own value-added services. Hosted solutions also create opportunities for resellers to act as agents for service providers.
- Virtual service providers purchase wholesale services from SPs and offer their services to end-customers directly. A Virtual service provider manages the solution at the application layer at each customer or VAR instance.
- Users are the UC service consumers. Users may be associated with an enterprise that has a premise-based system, or with an enterprise that is buying hosted services from a service provider.
- Data centers provide floor space or servers for hosting virtual machines and applications. A data center offers expertise at an operating system level and typically does not manage any features within the applications or images.

Software as a Service

Software as a Service (SaaS) is an industry term for cloud services that offer end-customer applications or functions as a service. The Mitel UC portfolio enables service providers to build SaaS offers from voice-only to UC-intensive services.

For example, in a SaaS arrangement, the end-customer pays a service provider every month for 30 extensions. Each extension includes voice-mail, presence, and instant messaging. The end-customer does not have any equipment installed at their site except for desk phones that connect into their IP infrastructure.

Platform as a Service

Platform as a Service (PaaS) is an industry term for cloud services offering a complete solution that includes the middle-ware and operating system layers, and in some cases. applications, plus additional resources like storage and network devices.

PaaS customers are charged for a complete instance of the solution. The PaaS provider scales resources to match application demand so that the cloud user does not have to allocate resources manually.

For example, in a PaaS arrangement, the service provider leases Mitel UC capabilities to a virtual service provider. The virtual service provider pays the service provider based on the capacity they are leasing.

Unified Communications as a Service

Unified Communications as a Service (UCaaS) refers to cloud services providers that offer Unified Communications as an application layer solution built by a service provider and managed by the UCaaS customer, typically another service provider. This is a type of Platform as a Service offering, customized for Unified Communications service providers.

Mitel offers UCaaS, and it is sometimes referred to as “Mitel built, partner managed”.

Infrastructure as a Service

Infrastructure as a Services (IaaS) is an industry term for cloud services providers that offer computing resources, using physical or virtual machines. IaaS providers pool data center resources to support large numbers of virtual machines for scaling services up and down according to customers' changing needs. IaaS solutions may offer additional networking and storage resources on-demand.

IaaS customers install and manage their application software on the cloud infrastructure and the IaaS provider maintains the virtualized infrastructure and physical machines.

For example, in an IaaS arrangement, the service provider leases server space from a data center provider for use in hosting a MiCloud Business UC solution.

MiCloud Business overview

Determining the best architecture to fit your business model starts with looking at Mitel's UC portfolio relative to three distinct customer markets.

MiCloud Business enables service providers to offer UC services to a broad range of customers ranging from small businesses to large multi-site enterprises. The architectures are optimized for different market segments characterized by their end-customer line sizes, the capabilities offered by the UC feature set, and the service provider's data center.

Mitel also offers contact center solutions with rich UC capabilities, including multi-tenant contact centers.

MiCloud Business 3.3 introduces the addition of MiCloud CRM Integrations. MiCloud CRM Integrations uses Mitel Open Integration Gateway to integrate telephone service seamlessly with many of the most common Customer Relationship applications.

Mitel UC solutions include a range of call control platforms and application offerings. This Blueprint document focuses on the MiVoice Business-centric solution, with the platform and application lineup shown in Table 1, as compared to earlier releases.

Table 1: MiCloud Business platforms and applications by MiCloud release

COMPONENT / MICLOUD VERSION	3.0	3.1	3.2	3.3
VOICE PLATFORMS				
MiVoice Business	7.2 SP1	7.2 SP1	8.0 PR2	8.0 PR3
MiVoice Business Multi Instance	2.0 SP1	2.0 SP1	2.0 SP1	2.0 SP1
MiVoice Business Express	7.1	7.2.1	7.2	7.3 PR1
UNIFIED COMMUNICATIONS (UC) APPLICATIONS				
MiCollab	7.1 PR1	7.2.1	7.2.2	7.3 PR1
MiCollab Client Multi-tenant	7.1 PR1	7.2.1	7.2.2	7.3 PR1

Table 1: MiCloud Business platforms and applications by MiCloud release

COMPONENT / MICLOUD VERSION	3.0	3.1	3.2	3.3
CONTACT CENTER APPLICATIONS				
MiContact Center Business	8.0 SP1	8.1	8.1 SP1	8.1 SP2
MiVoice Business Reporter	8.0 SP1	8.1	8.1 SP1	8.1 SP2
MiVoice Integration for Salesforce		2.0	2.1	2.1
MiVoice Integration for Google		1.1	1.1	1.1
MiVoice Call Recording	9.0 SP2	9.0 SP3	9.1	9.1 SP1
MiVoice Border Gateway Secure Recording Connector	9.2	9.3.1	9.4 PR2	9.4 PR2
MANAGEMENT APPLICATIONS				
Oria	5.0	5.1	5.2	5.3 SP1
Mitel MarWatch	5.1	5.1	--	--
Mitel Performance Analytics	--	--	2.1	2.1
MiCloud Business Analytics	9.0	9.0	3.2	3.3
NETWORKING APPLICATIONS				
MiVoice Border Gateway	9.2	9.3.1	9.4 PR2	9.4 PR2
MiCloud Management Gateway	5.0	5.0	5.0	5.0
Open Integration Gateway	3.0	3.0	4.0	4.0
PRODUCTIVITY APPLICATIONS				
Vidyo	--	Cloud-based	Cloud-based	Cloud-based
MiCloud CRM Integrations	--	--	--	3.3
OTHER				
Redirection and Configuration Service (RCS)	1.1	1.1	1.1	1.1

Business considerations

In addition to technical requirements, many business considerations have a bearing on the choice of deployment architecture, including, but not limited to:

- How the architecture scales and the impact on return on investment.
- The capability of the architecture to meet expected service level agreements (SLA)
- The training, skills, and staffing needed to support the solution and provide customer support

- The preferred end-device management strategy (purchase, lease, returns) for end-customers

This guide focuses on the technical considerations for the choice of architecture.

This solution Blueprint documents Mitel-designed architectures for hosted solutions in the small, medium, or large enterprise market. These reference designs address the requirements of five typical end-customers. This guide describes the architecture, capabilities, and capacities of each architecture, and is essential for scoping, comparing, designing, and planning a cloud UC deployment.

The MiCloud Business Solution architectures are designed to address the requirements of most deployments. Mitel Professional Services is available to help engineer the architecture details when unique business requirements create a need for variations from one of the documented architectures, or if a Scalable architecture deployment is required (“Scalable architecture” on page 15).

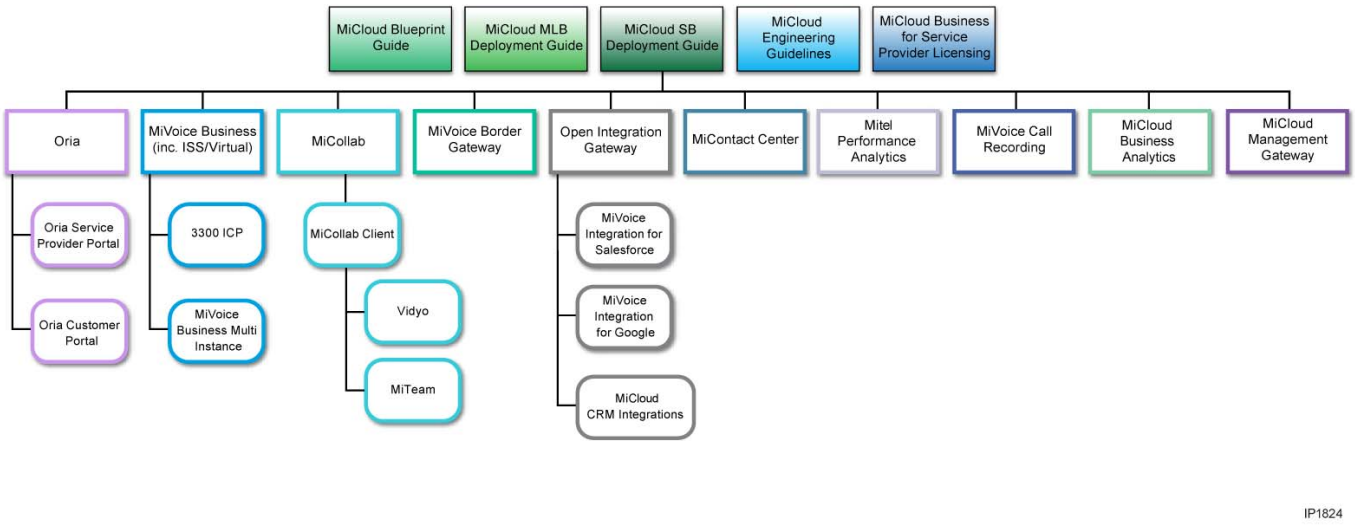
This guide does not include deployment instructions, pricing, order codes, or Release Note details. Mitel documentation is available on-line on Mitel OnLine.

Deployment guides for selected UC solutions provide high-level requirements, specifications, networking considerations, best practices, and other useful references to plan and implement a successful solution deployment. The following documents exist to support your UC solution.

- *MiCloud Business Multi-Instance Deployment Guide*
- *MiCloud Business Virtual Deployment Guide*
- *MiCloud Engineering Guidelines*
- *Virtual Appliance Deployment Solutions Guide*
- MiCloud Alarms Database
- Product documents are also required for the design and use of your UC system. Product-specific documents are available on Mitel OnLine.

MiCloud Business Deployment guides do not include most product-specific details, instead referring to the appropriate product guide and section name. See Figure 2 for the list of products used in the Solution; each product has its own documentation suite.

Figure 2: MiCloud documentation hierarchy

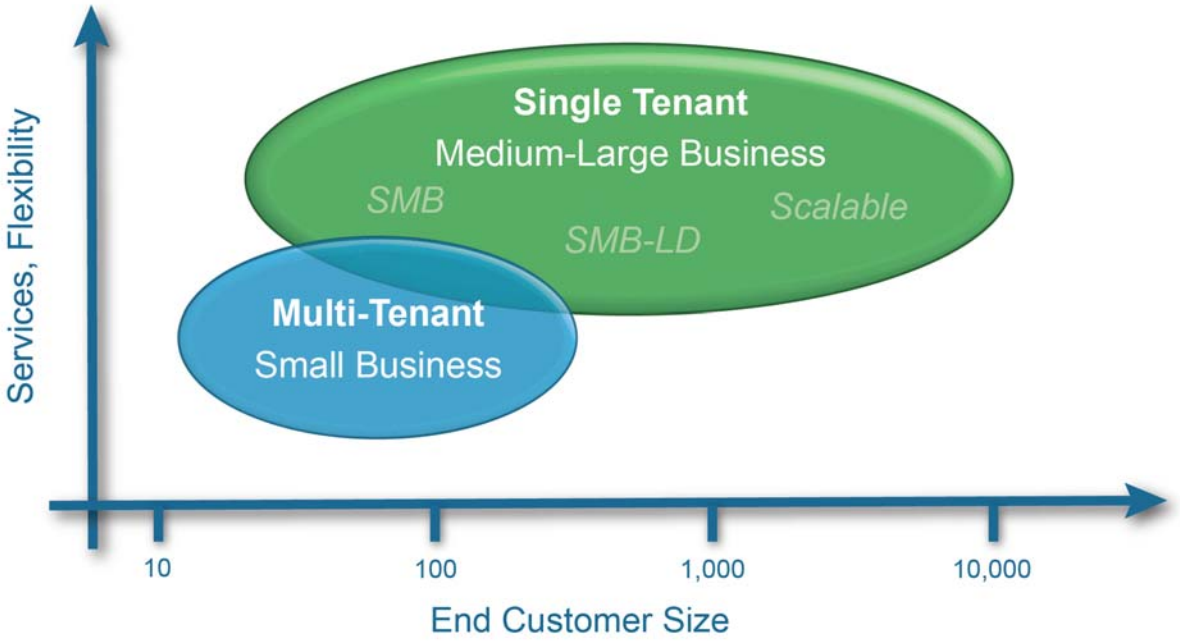


MiCloud Business Solution

MiCloud Business Solution enables service providers to efficiently design, deploy, and manage hosted Unified Communications (UC) services for small business, mid-market, and enterprise customers. MiCloud Business Solution offers commercial and licensing terms that are consistent with service provider business models. The MiCloud solution includes offers based on Telepo, and UC service offerings from Mitel Cloud Services (MCS). This document focuses on MiVoice Business-based architectures.

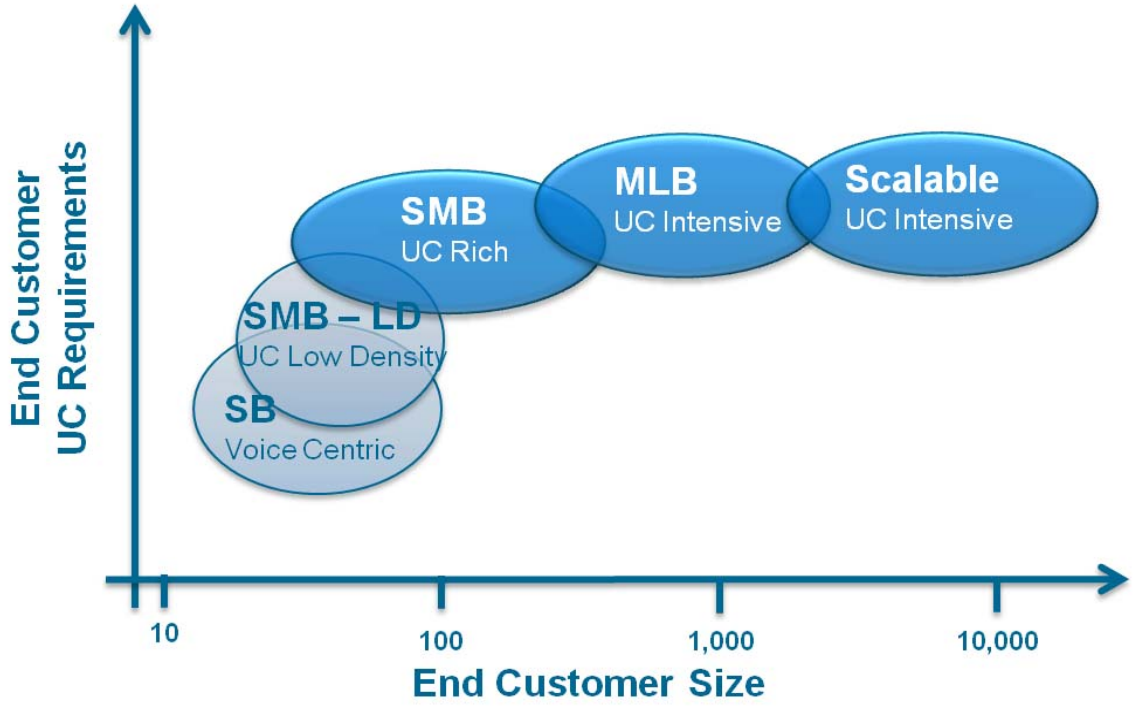
Five architectures are defined to address typical service provider and end-customer requirements for the MiCloud Business Solution. The following graphic plots the architectures relative to a range of end-customer sizes and end-customer UC requirements. Figure 4 shows the potential best fit of each architecture, not the actual limits to customer size or UC features.

Figure 3: Multi-tenant vs. Single-tenant architectures



MiCloud Business 3.0 introduced four new enhanced services overlays that can be added to each architecture to contribute services such as call center, video, and metrics. For details, see “MiCloud Enhanced Services architecture overlays” on page 77.

Figure 4: MiCloud Business Solution architectures



Who uses the MiCloud Business Solution?

MiCloud Business Solution can address the requirements of a wide variety of service provider segments. Architectures leveraging MiVoice Business Multi-Instance are well-suited to the following types of service providers:

- Established Telcos looking for an operationally-efficient hosted telephony offerings differentiated by the addition of light UC capabilities.
- Value added resellers (VAR) looking to expand their enterprise business with a hosted platform.
- Service providers targeting the business market segment where telephony is considered a necessity rather than a business differentiator, where price sensitivity is high and complexity threshold is low.

Architectures leveraging MiVoice Business Virtual are well-suited to the following types of service providers:

- Converged voice/data telecommunication providers with data center-type infrastructure
- Value added resellers (VAR) with VMware expertise, capable of bundling MiCloud Business Solution capabilities with their own value-added features
- Hosting service providers addressing the business application market
- Services providers targeting the business market segment in which unified communications is considered a business differentiator; where integration with business applications is likely, and integration with mobile devices is expected.

MiCloud Business Solution capabilities

The MiCloud Business Solution solution offers UC services with seamless integration of voice, e-mail, unified messaging, mobility, presence, conferencing, contact center applications, and more. The MiCloud Business Solution solution is built on Mitel's field proven call control software, and extends these capabilities into a hosted offering.

For the service provider, the MiCloud Business Solution solution offers:

- Flexibility to address end-customer businesses ranging in size from 25 users to over 10,000 users, with single-site and multi-site deployments
- Range of availability and business continuity configurations
- Ability to rapidly scale capacity with template deployment models and ability to deploy multiple instances on common hardware platform
- Manage voice as a business application with deployment of hosted UC services along with other hosted business applications, reducing requirements for voice-specific training
- Common networking and management tools used for other MiVoice Business deployments

For the end-customer, managed unified communications offers:

- Hundreds of call control features available as standard
- Dynamic status to improve communication productivity
- Support for a wide range of devices available from Mitel, plus qualified third-party SIP devices, including SIP ATA devices
- Predictable service levels and operational expenses
- Reduced need for specialist resources in-house

MiCloud Business Solution architectures

MiCloud Business Solution is adaptable to meet a wide range of network architecture and system configuration requirements. Selecting an appropriate architecture requires comparing architecture capabilities to deployment needs. Table 2 provides a comparison, across the architectures, for several key deployment considerations.

Table 2: MiCloud Business Solution architectures comparison

	MICLOUD BUSINESS SOLUTION FOR SERVICE PROVIDER					
	MIVOICE BUSINESS MULTI INSTANCE	"HYBRID"	MIVOICE BUSINESS VIRTUAL			
ARCHITECTURE	SB	SMB-LD	SB VIRTUAL	SMB	MLB	SCALABLE[1]
Market segment size	• Typically 25-50 users • Can scale to 1000+ users	• Typically 25-250 users • Can scale to 1000+ users	• lower capacity than SB	• Typically 50-250 users • Can scale to 500 users	• Typically 500-5000 users • Can scale to 5000 users	• Typically 1000-5000 users • Multiple business units up to 5000 users each • Can scale to 10000+ users
Services	Voice-centric w/option for light UC	Voice-centric w/options for occasional full UCC	Voice-centric w/option for light UC	UCC	UCC	UCC
Business voice platform	MiVoice Business Multi-Instance	MiVoice Business Multi-Instance	MiVoice Business Virtual	MiVoice Business Express	MiVoice Business Virtual w/resiliency	MiVoice Business Virtual w/resiliency
UC applications platform	MiCollab Client Multi-Tenant (server)	Optional MiCollab Virtual (full), per customer	MiCollab Virtual	MiVoice Business Express	MiCollab Virtual	MiCollab Virtual, per business unit
Management platform	Oria	Oria	Oria	Oria	Oria	Oria
Access network	MPLS	MPLS	MPLS	MPLS	MPLS	MPLS

[1] Requires Mitel Professional Services

Service providers deploying MiCloud Business Solution architectures may choose one or more architectures to meet their customer requirements. For example, service providers may choose the SB-MT architecture for the majority of their customers and augment with the SMB-LD architecture for a few customers requiring UCC capabilities. This combination of SB architecture with SMB-LD provides a voice-centric solution with light UC and occasional full UCC capabilities. Another service provider may focus on the MLB architecture for mid-size businesses and offer the SMB architecture for a few smaller customers.

MiCloud Business Multi-Instance architectures

MiCloud Business Multi-Instance architectures are based on MiVoice Business Multi Instance, with the exception of Small Business Virtual, in which MiVoice Business Virtual instances are used in place of the instances in MiVoice Business Multi Instance.

Small Business (SB) architecture

The Small Business offering is based on the MiVoice Business Multi Instance product. It allows spinning up of new MiVoice Business instances very quickly, and without having to deploy new server hardware.

Oria Platform Manager automates creation of new Customers, based on blueprints you create.

The service provider's IP address space is independent from the customer's IP address space, making it simple to deploy. MiVoice Border Gateway/Session Border Controller (SBC) units are used at the edge of this network to demarcate connections between service provider, SIP trunk providers, and end-customers. End-customers can manage their own units using a publicly-accessible management portal.

Small Business Virtual (SB-V) architecture

This is the same multi-tenant architecture as for the SB solution. The only differences are in the platform packaging where multiple instances of MiVoice Business Virtual are deployed in place of the instances of MiVoice Business Multi Instance, i.e. MiVoice Business Call Manager and Media Server. Also, aligned with deployment within an IaaS virtualized infrastructure, the MiVoice Border Gateway Virtual would be substituted for the MiVoice Border Gateway on ISS.

MiCloud Business Virtual architectures

MiCloud Business Virtual architectures are based on MiVoice Business Virtual, with SMB using MiVoice Business Express, which is a virtualized bundling of MiVoice Business Virtual and MiCollab Virtual. MiCloud Business Virtual runs on a VMware infrastructure.

Small Medium Business, Low Density UCC (SMB-LD)

The Small Medium Business, Low Density UCC (SMB-LD) architecture uses private network connections, typically MPLS-based, from the hosted site to the customer premise. The hosted service address space belongs to the customer with no MiVoice Border Gateway/SBC/NAT function required between the hosted site and the customer site. The SMB-LD architecture is not Internet-based. Connections between the service provider and customer may be limited to the reach of the network provider, including the reach due to any peering arrangement with other network providers, or carriers. Although more complex than the SB architecture, the SMB-LD architecture offers private connectivity and the possibility to provide Service Level Agreements (SLA) for time critical voice services.

Individual hosted customer services are isolated from each other and the service provider network through the use of VLANs and VRF routers. Each customer has their own MiVoice Border Gateway or third-party SBC to provide network isolation to the SIP trunk service provider.

End-customers may manage their own units directly within the customer network, or via a publicly-accessible management portal.

Small Medium Business (SMB) architecture

MiCloud Business Solution architecture for small to medium businesses (SMB) is based on the MiVoice Business Express product. MiVoice Business Express includes call control, applications, and gateway functionality in a single virtual appliance for smaller sites with up to 500 users. The platform includes a setup wizard and system default settings to simplify installation and minimize initial system configuration.

Optionally, Oria Platform Manager automates creation of new Customers, based on blueprints you create. Platform Manager currently supports only non-resilient SMB deployments.

Medium Large Business (MLB) architecture

The Medium Large Business (MLB) architecture addresses end-customers with 500 to 5000 users. The architecture may also be used to address smaller customers that require a resilient hosted offer. The solution relies on the Mitel virtual appliance—MiVoice Business Virtual, MiCollab Virtual, and MiVoice Border Gateway Virtual with Oria solution management.

Scalable architecture

For the very large enterprise, MiCloud Business Solution may be scaled with building blocks based on the MLB architecture.

Communication between the customer sites and the private cloud is performed through an MPLS network.

Note: This architecture requires engaging Mitel Professional Services to assist with the design and implementation.

Key architecture components

The MiCloud Business Solution architectures are based on a common set of solution components. The key components include:

- **MiVoice Business**

  The MiVoice Business communications system provides IP telephony with seamless IP networking and SIP trunking. MiVoice Business offers over 500 telephony features provided to users through easy-to-use phones and web-based user desktop interfaces. MiVoice Business is available on different platforms, including custom hardware (3300 ICP), industry standard servers (x86), and virtualized environments (VMware® and Microsoft® Hyper-V™).

- **MiCollab**

  MiCollab unifies Mitel applications into an easy to use, cost-effective communications solution. Users have a single point of access to all their Mitel applications through the My Unified Communications portal, a web-based interface. MiCollab may be deployed with

multiple applications per server or with a single application per server, when increased capacity is required. The services co-resident within MiCollab include:

- **MiCollab NuPoint Unified Messaging (MiCollab-UM)** - Provides voice messaging, unified messaging, paging support and speech auto attendant; Users can access their voice mails remotely, listen to their voice mail messages via integrated e-mail clients, or through the telephone user interface.
- **MiCollab Speech Auto Attendant (MiCollab-SAA)** - Provides speech-enabled auto attendant.
- **MiCollab Client** - Provides contact management, dynamic status, instant messaging and audio conferencing.
  - MiCollab MiTeam - Enhanced collaboration offering from Mitel Cloud Services. MiTeam allows users to share documents in a project driven environment, chat on line with the project team, mark-up documents, schedule meetings, and share desktops. For the MLB/SMB architectures, MiTeam is integrated with MiCollab Mobile Client and MiCollab Web Client.

Note: For MiCloud Business Virtual, real-time audio conferencing and web collaboration is enabled by MiCollab AWV integration. For MiCloud Business Multi-Instance, real-time audio conferencing and web collaboration is enabled by the new MiTeam Meet Internet Audio Web and Video conferencing.

- **MiCollab Audio, Web and Video Conferencing (MiCollab-AWV)** - Provides web conferencing that supports audio, video, chat (text), and presentations.
- **MiVoice Border Gateway** - See “Mitel Gateways” below.
- Integral management tools including MiCollab Suite Application Services, which provides centralized management of shared system resources, provisioning interfaces and license management, and **MiCollab Client Deployment**, which supports simplified deployment and configuration of MiCollab mobile clients.

- **Management Applications -** Management of the communications solution is provided by:
  - **Embedded Native Management** - Provides web-based access for configuration of the full capabilities of the MiCloud platforms. Native management tools are included in all MiCloud platforms.
  - **Oria** - Automates the otherwise manual process of provisioning multiple MiVoice Business and MiCollab instances, and allows customer self-service.
  - **Mitel Performance Analytics** - Provides fault and performance monitoring for Mitel components and selected network devices. These capabilities are enabled with Probes, diagnostic tools deployed in the end-customer's network. Probe may be deployed in the data center network and/or inside the end-customer's on-premise network, depending on the specific monitoring required.
- **Mitel Gateways**
  - **MiCloud Management Gateway** - Provides specialized 1:1 NAT capabilities to support management access from the service provider domain to multiple customer domains.

    - **MiVoice Border Gateway** - Provides a specialized application proxy supporting SIP, MiNet, and web protocols. Some of the key functionality provided by MiVoice Border Gateway includes:
        - Teleworker service for connection to remote SIP and MiNet end-points
        - SIP trunk proxy for connection to external third-party SIP providers
        - Secure Recording Connector to facilitate recording of voice streams by call recording equipment
        - Web proxy to allow UC web clients to connect securely to LAN-based applications
    - **Open Integration Gateway** - Provides a proxy for connection to business applications, such as SalesForce and Google.
- **MiContact Center Business**

  A powerful Contact Center solution providing both basic voice call center capabilities and rich multi-media contact capabilities, and supported by a comprehensive real-time and historical reporting engine.
- **MiVoice Call Recording**

  MiVoice Call Recording provides core voice call recording and quality monitoring that can be deployed for general business users and contact center agents.
- **MiVoice Business Reporter**

  MiVoice Business Reporter provides Customers with rich business communications usage reporting and optional cost analysis for departmental attribution.
- **MiVoice for Skype for Business**

  MiVoice for Skype for Business enables Mitel call control, natively launched from Microsoft Skype for Business.
- **Mitel end-points**

  Mitel offers a range of desk phones, soft phones, wireless phones, and web-based applications to suit user communication preferences.

The solution components are available in various packages and configurations optimized for different network and system requirements. These variations are reflected in the component selection and network design for the architectures described in the following sections.

Cloud services

MiCloud also offers the following cloud services:

- Enhanced end-user Services
    - Vidyo. Immersive video offering from Mitel Cloud Services. For the MLB/SMB architectures, Vidyo is integrated with MiCollab Client.
    - MiCloud Business Analytics. Business analytics for call metrics to improve communications management and reporting.
    - MiCloud CRM Integrations. Desktop integration of telephone and CRM applications for a more productive call center.

- Management services
  - Application Management Center (AMC) - Provides services for software downloads and license management.
  - Redirection and Configuration Service (RCS) - Used to simplify configuration of Mitel IP phones.
  - Redirect Server (RS) - Used to simplify installation and configuration of MiCollab on mobile phones.

Note: Some infrastructure components, such as Layer 2 switches and routers, are not included or described in this guides.

Chapter 2

MICLOUD BUSINESS SOLUTION ARCHITECTURES

MiCloud Business Solution architectures

This chapter describes the Mitel Unified Communications reference designs to meet service provider and customer requirements, network connectivity requirements, and system Unified Communications scaling. The solutions cover scaling from a few users up to and beyond 10,000 users. Each user may be associated with multiple devices.

The architectures include different virtualization technologies, and in many cases, a mix of technologies to take advantage of different features. The applications and call server platforms range from on-premise servers and appliances, through Mitel optimized virtual call servers, to virtualized application packages running on the VMware virtual platform.

The MiCloud Business Solution architectures are:

Choosing the best MiCloud architecture

When comparing and planning a MiCloud deployment, both business and technical factors affect the choice of reference architecture that will best serve the needs of the Service Provider and the Customers they will serve. Key technical considerations are shown in Table 3.

Table 3: MiCloud Solution comparison

TECHNICAL FACTOR	MICLOUD BUSINESS SOLUTION FOR SERVICE PROVIDER	
	MIVOICE BUSINESS MULTI INSTANCE	MIVOICE BUSINESS VIRTUAL
Scalability	SB/SB Virtual: Typically 25-50 users; can scale to 1000+ users	Platform variants to address scalability MLB: Typically 250-1500 users; can scale to 5000 users SMB: Typically 50-250 users; can scale to 500 users SMB-LD: Typically 25-250 users; can scale to 1000+ users Scalable 1: Typically 1000-5000 users; multiple business units up to 5000 users each, can scale to 10,000+ users
Tenant mode	Multi-tenant and multi-instance with shared network architecture	Single-tenant with isolated or shared network architecture
Server Infrastructure	Typically Industry Standard Servers (ISS) Some platforms support virtualized	Typically virtualized Some platforms support ISS

Table 3: MiCloud Solution comparison

TECHNICAL FACTOR	MICLOUD BUSINESS SOLUTION FOR SERVICE PROVIDER	
	MIVOICE BUSINESS MULTI INSTANCE	MIVOICE BUSINESS VIRTUAL
WAN network	Public or private; requires routed access	Public or private; supports LAN extension and/or routed access

Service providers addressing a range of market segments may choose to deploy one or both of these architecture types to provide a range of competitive service offerings. The SB architecture for a competitive voice-centric offer with light UC may be combined with the MLB architecture for rich UC services. Application packaging may be chosen to address virtualization preferences and scalability. These technical factors are described in more detail in the following sections:

- “Scalability based on customer size” on page 22
- “Multi-tenant versus single-tenant” on page 22
- “Platform server infrastructure” on page 27
- “WAN Connectivity” on page 28

These factors affect the Customer service and management capabilities, and the Service Provider operational costs.

Scalability based on customer size

The service provider's choice of target market, particularly customer size, affects the choice of the recommended reference architecture.

Multi-tenant architectures have significant cost advantages over single-tenant architectures because infrastructure costs are spread across multiple tenants. Mitel multi-tenant applications are designed to support multiple tenants within the maximum total user capacity of the platform, so the reference architecture is designed with maximum capacity platforms and is most cost-effectively deployed for smaller customers.

Single-tenant architectures have advantages when platforms are sized by customer loads. The MLB reference architecture is designed to address mid to large-size customers. Platform variations within the architecture allow scaling to various target markets, with the SMB and SMB-LD architectures designed for small to mid-size customers. The Scalable architecture is designed for very large enterprise customers.

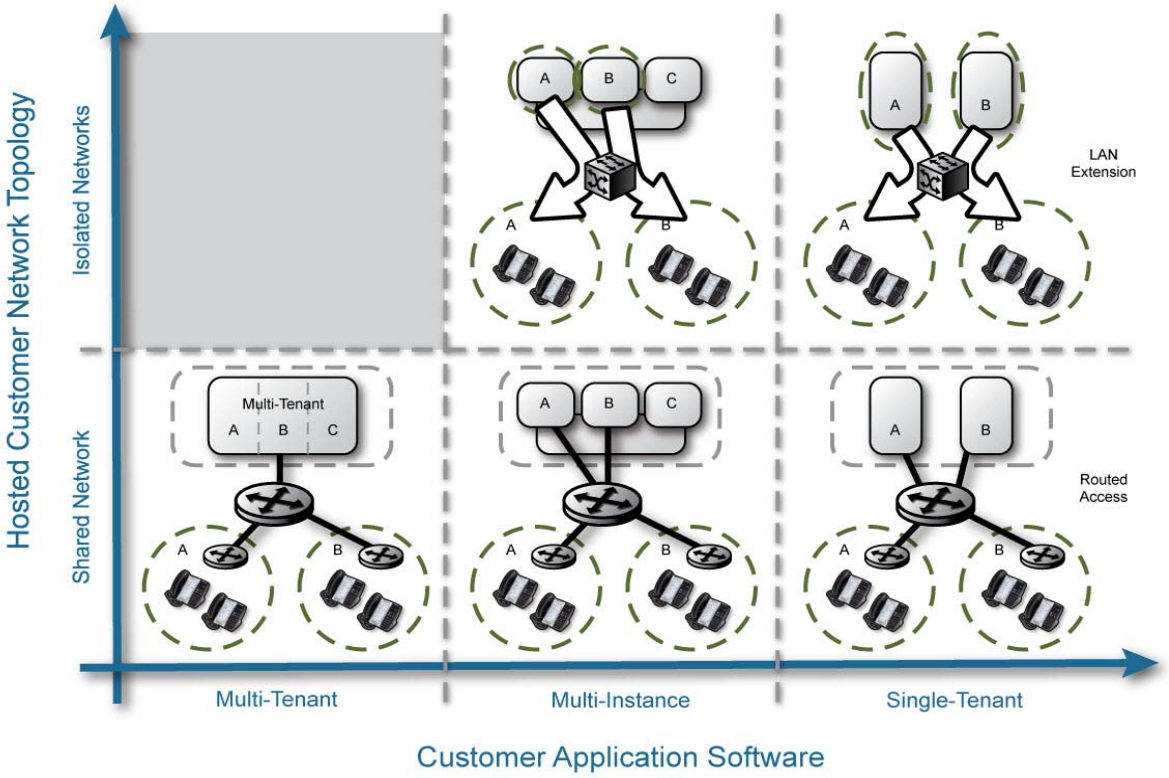
Multi-tenant versus single-tenant

Public cloud enterprise software solutions are broadly classified as multi-tenant or single-tenant architectures. Many vendors compare the pros and cons of these alternate architectures, often weighting their arguments in favor of the solution they can offer. Mitel offers both multi-tenant and single-tenant solutions.

When considering multi-tenant and single-tenant solutions, there are two major considerations; the application platform choices—multi-tenant, multi-instance, and single-tenant software—and the network architecture choices—shared and isolated network architectures.

These considerations are interrelated, and the application platform may constrain the network architecture choice. Typically, multi-tenant applications are deployed on a shared network. Multi-instance and single-tenant applications may be deployed on shared or isolated network architectures as shown in Figure 5.

Figure 5: Multi-tenant versus single-tenant design choices



The MiCloud solution design choice should consider the impact of both the application platforms and the network architecture. The characteristics of the deployment depend on both choices.

Multi-tenant, multi-instance, and single-tenant applications

Software applications are designed to support multiple customers in one of several ways:

- Multi-tenant applications support multiple customers within a single instance of the application, running on a single operating system with customers sharing resources available to the application. Customer data is typically commingled within a single data persistence technology. Application code is used to enforce isolation between customers.
- Multi-instance applications support multiple customers with multiple instances of the application running independently on a common base software layer and operating system layer. Customers may have some dedicated resources at the application layer and share resources in the common base software layers. Typically data persistence is isolated per customer within a common data storage technology.

- Single-tenant applications allocate a dedicated instance of the application with dedicated operating system and data persistence for each customer. To support multiple customers, multiple instances of the applications typically reside on a common underlying virtualization or hardware infrastructure.

In all of these architectures, the platforms may be owned and operated by the service provider.

Mitel offers multi-tenant, multi-instance, and single-tenant applications, depending on the specific application. Table 4 provides a comparison of multi-tenant and single-tenant applications. For multi-instance applications, the benefits and constraints fall somewhere between the multi-tenant and single-tenant applications, depending on the specifics of the application.

Table 4: Multi-tenant versus single-tenant applications: comparison

CAPABILITY	MULTI-TENANT	SINGLE-TENANT
Services	Limited services; lower capabilities for certain services	Full capabilities for all services
Customer self-management	Restricted to selected end-user services	Full capabilities to manage end-user services, and in some cases, platform customizations
Customization	Limited capability	Full capability
Performance	Shared resource allocation with headroom to mitigate cross-tenant impacts	Based on instance resource allocation
Scalability	Scales down efficiently	Scales up effectively
Security	Solution hardened to highest customer requirements with associated costs	Customizable to meet customer requirements Presents a smaller target as breaches affect a single customer
Installation and maintenance	Centralized installation and management across multiple tenants May restrict content available for off-site backup	Operational requirements per customer Backup and restore more manageable with single customer data
Upgrades	Platform-wide, all tenants in single maintenance window All tenants upgraded to provide new capabilities or bug fixes for any one tenant	Customizable per customer Upgrades as required for specific customer
Operational costs	Operational activities span multiple customers, distributing costs Single software release across multiple customers. reducing technical support requirements	Per customer costs typically higher Multiple software releases supported across customer base
Hardware costs	Higher platform costs but typically lower per tenant costs at full occupancy	Per customer costs; with platforms scaled to customer requirements costs are similar, particularly for larger customers

Multi-tenant applications are suited to offering a standardized service based on a platform optimized for operational and resource cost. Multi-tenant applications address the business

market segment in which telephony is considered a necessity rather than a business differentiator. Price sensitivity is high, and complexity threshold is low.

Single-tenant applications are suited to offering a wide range of services, with opportunity for customization to address specific customer requirements for services, connectivity, reliability, and security. Single-tenant applications address the business market segment for which communications and collaboration are considered business differentiators. Customization, including integration with business applications, is expected.

All Mitel user services platforms are available for single-tenant deployment. Many platforms also support multi-tenant and/or multi-instance operational modes. Most management platforms are available for multi-tenant deployment. See Table 5 for details.

Table 5: Mitel applications supporting multi-tenant and/or multi-instance modes

APPLICATION	MULTI-TENANT[1]	MULTI-INSTANCE[1]	SINGLE-TENANT[1]
MiVoice Business	Not supported[2]	Y[3]	Y
MiCollab	MiCollab Client only	N	Y
MiContact Center Business	Core services only[4]	N	Y
MiVoice Call Recording	N	N	Y
Oria	Y	N	N/A[5]
Mitel Performance Analytics	Y	N	N/A[6]
MiCloud Management Gateway	Y	N/A	N/A
MiVoice Border Gateway	Y	N	Y
Open Integration Gateway[7]	N	N	Y

Notes:

1. For multi-tenant, multi-instance, or single-tenant applications, multiple instances of the application may be required to support large scale deployments.
2. MiVoice Business multi-tenant mode is not supported for MiCloud solutions.
3. MiVoice Business Multi-Instance is supported on Industry Standard Server (ISS) deployments. It is not supported on third-party virtualization platforms.
4. MiContact Center Business supports a subset of services when deployed in multi-tenant mode. Details are provided in “MiContact Center Business” on page 98 and in the *MiCloud Engineering Guidelines*.
5. Oria is offered only in the Managed Service Provider Licensing program.
6. Mitel Performance Analytics supports deployment of the server for a single-tenant, although typically the operational and infrastructure costs would only be justifiable for very large enterprises. Most businesses are effectively served from a cloud-hosted multi-tenant platform.
7. Open Integration Gateway is available for single-tenant deployments only. Multiple instances of OIG may be deployed within a shared network to support multi-tenant solutions.

Shared versus isolated network architectures

The network design for MiCloud application platforms typically follows one of two different architectures, as shown in Figure 5:

- Shared network architecture: Multiple customer platforms share a common IP address space within the hosting environment.
- Isolated network architecture: Each customer’s platforms are deployed in an isolated network, often extending the customer's own address space into the hosting environment.

For shared networks, multiple customers' platforms share a common address space within the hosting environment, and these must be isolated from the customer's own address space. An example of this is isolating the common address space from that used for the customer’s own premise-based network. This network isolation is achieved through the use of firewalls and NAT rules. The MiVoice Border Gateway is recommended for use with Mitel application traffic.

End-user access to the hosted applications is available via public IP addresses, sometimes referred to as Over-the-Top (OTT) access. For multi-tenant applications in such a shared customer network, isolation of traffic is typically based on associating specific end-points and streams with the appropriate tenant identifier. For single-tenant applications in this type of shared customer network, isolation of traffic is typically based on addressing.

For isolated customer networks, each customer's platforms have a dedicated address space. This allows application platforms in the hosting environment to share a common address space with the specific customer's premise-based networks. Within the hosting environment, network isolation between customers, and between customer networks and the service provider network, is typically achieved through the use of VLANs. This allows flexibility to support overlapping IP address spaces, allowing accommodation of different customer IP address schemes. Access to the applications is supported over both private networks—commonly MPLS—and public networks, with appropriate firewalls and application gateways. The MiVoice Border Gateway is optimized for public network access to Mitel applications.

For both shared and isolated customer networks, service provider management applications are deployed in a service provider’s dedicated address space, sometimes called the management network. Firewalls and NAT are used to isolate the service provider network from the customer networks.

The shared network architecture is suited to a standardized offer for price-sensitive customers. The isolated network architecture allows service providers to offer a rich service set with guaranteed QoS (through service level agreements).

Table 6 provides a comparison of shared and isolated network architectures.

Table 6: Shared versus isolated network architecture comparison

CAPABILITY	SHARED	ISOLATED
Market reach	Global via public network addresses; independent of any service provider network	Private network limited to the reach of network service provider including any peered carrier networks; global public network addresses

Table 6: Shared versus isolated network architecture comparison

CAPABILITY	SHARED	ISOLATED
Service capabilities	May be limited due to routed access between applications and end-devices	Full range similar to premise-based or private hosted applications when accessed over private networks; public access may limit capabilities
Quality of Service (QoS)	May be limited QoS may be available when customer site is reachable by the service provider network or peered carrier network	SLAs with QoS guarantees available for private networks
Security	Higher exposure due to public networks	Private network provides isolation
SIP Trunking gateway	Common gateways allowing higher trunk usage for similar blocking rates	Dedicated gateway per customer
Access gateway	Common gateways allowing higher utilization	Dedicated gateway per customer

Multi-tenant versus single-tenant solutions

There are obvious advantages in deploying multi-tenant applications in shared network architectures, enabling standardized services with minimized operational and infrastructure costs. Similarly, single-tenant applications deployed in isolated network architectures enable fully-featured services and connectivity options.

For solutions using multiple applications, there are advantages to using more varied combinations. In general, multi-instance and single-tenant applications may be deployed in shared network architectures with appropriate non-overlapping network addressing schemes. This enables offering of a richer service set, but involves trading off against higher operational costs to manage these single-tenant applications.

The converse, multi-tenant applications operating across isolated network architectures, often involve more complicated network connectivity and application gateways, and this may offset any operational or infrastructure advantages of the multi-tenant applications. The exception is for applications specifically engineered for operation across isolated network architectures, Oria and MiCloud Management Gateway (MMG), for example.

With respect to the reference architectures described in this guide, the multi-tenant architecture is based primarily on multi-tenant and/or multi-instance platforms deployed in a shared network architecture. The single-tenant architecture is based on single-tenant, customer-facing applications deployed in an isolated network architecture, with multi-tenant management applications, including Oria and Mitel Performance Analytics. The single-tenant architecture may be deployed on a shared network architecture when constrained to support only public end-user access.

Platform server infrastructure

Hosted applications may be deployed in a Service Provider-owned data center or in a third-party data center via various IaaS commercial models. In these models, the service provider that owns and manages the MiCloud applications may have more or less access to various aspects

of the underlying infrastructure. Even in the case of Service Provider-owned data centers, responsibility for deploying servers and managing virtual machines and responsibility for managing applications deployed on the virtual machine may span different functional groups.

Typical access scenarios for deploying and managing the underlying computing resources that support the MiCloud applications include:

- Full access to servers and networking equipment
- Access to VMware virtualization tools, such as vCenter™, to configure and deploy virtual machines on specific servers, set affinity rules, and configure High Availability
- Access to VMware orchestration tools, such as vCloud Director®, to deploy applications on an abstracted model of virtual machines

See the *MiCloud Business Engineering Guidelines* and the *Virtual Appliance Deployment Solutions Guide* for details.

WAN Connectivity

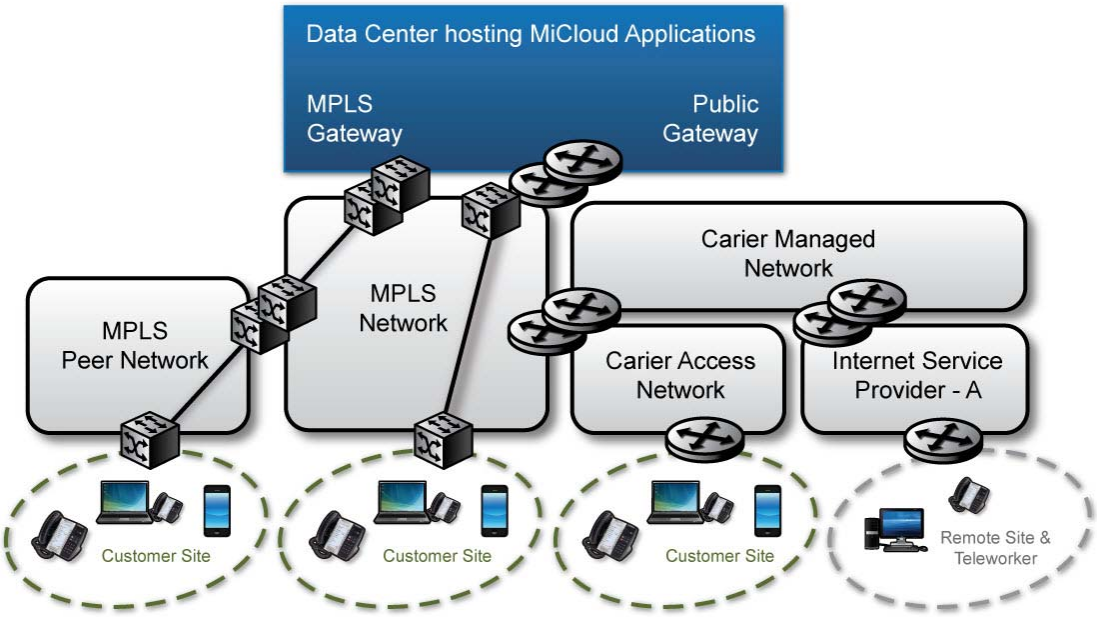
For any cloud-hosted service, the network between the cloud-based servers and end-user clients affects the responsiveness of the applications and the Quality of Service (QoS) achieved by media streaming services, such as audio and video connections. This network is typically composed of LAN links, both in the data center and customer premise, and the WAN links connecting the two. With current networking equipment, LAN links typically offer high bandwidths at moderate costs, and any networking limitations arise from the choice of WAN link.

The WAN connection between a customer premise and data center is typically composed of a number of components:

- Customer network access device that converts from the internal LAN to the WAN technology
- Access network provided by a carrier with direct customer connections
- Intra-office transport networks to connect to the data center provided by network service providers
- Data center network access gateway to convert from the WAN technology to the data center LANs.

A range of networking options is shown in Figure 6.

Figure 6: MiCloud WAN networking



The WAN network connection can range from:

- Public Internet connections using a modem to support Teleworkers connecting through local Internet service providers into the carrier public data network
- Public Internet connections using premise access devices with sufficient performance in the access network and gateways to support customer sites
- Private peered data networks with premise access devices supporting transport protocols that provide Service Level Agreements (SLA) that guarantee bandwidth, delay, and jitter requirements, connecting over carrier private networks
- MPLS connections that provide virtual private networks with SLAs that guarantee network performance. MPLS provides a point-to-point type connection. These MPLS connections may be configured for access with LAN-based addressing that extends the customer address space into the data center. Alternatively, the customer addresses may be mapped via NAT to public addresses, and transported with MPLS to public gateways.

All of the reference architectures support both public and private routed network connections and MPLS connections. In the case of the multi-tenant architecture, the data center must be accessed via the routed network with NAT translation of customer site addresses. The transition from MPLS to IP routed networking may be done within the data center. For service providers with access network services, the service provider may offer fully managed networks in which the service provider extends their private network out to customer sites.

All MiCloud user services are available over both MPLS and public Internet WAN connections, but some user services may have degraded quality, and some platform networking services are not supported over public, unmanaged Internet connections. With public connections that are not guaranteed, the following conditions are possible:

- Voice quality may be affected for congested networks.
- Video conferencing resolution and quality of service may be sub-optimal.

The following services are not recommended or not supported over public, unmanaged Internet connections:

- Contact Center desktop clients are not recommended due to bandwidth requirements for management updates.
- Remote survivable gateways are not supported due to the networking protocols required for resiliency recovery back to the primary.

Architecture components

Table 7 describes the details of each of the components used in the reference architectures.

Table 7: Architecture components

COMPONENT	CONTEXT AND DEPLOYMENT DETAILS
MiVoice Business 3300 ICP	Call control engine on dedicated hardware providing: • Proprietary application platform for running MiVoice Business software • IP to PSTN gateway (analog and digital/PRI) • Analog and TDM phone connectivity • Built-in applications including voice mail, music on hold, ad-hoc conference, basic call recording • Access to different scaling platforms, with increasing scaling levels of analog/digital and PSTN connectivity
MiVoice Business Industry Standard Server (ISS)	Call Control engine running on Industry Standard Servers providing: • MiVoice Business call control software and integrated media services that run on Industry Standard x86 Servers • A rich communications system including access to SIP trunk • Scaling via seamless IP-networking
MiVoice Business Virtual	Call Control engine running in a VMware virtual environment providing: • MiVoice Business call control software and integrated media services that run on VMware virtualization platforms • A rich communications system with access to SIP Trunks • Scaling via seamless IP networking • Scaling through defined deployment configurations
MiVoice Business Multi Instance	Mitel optimized virtual platform for Call Control instances, providing: • High density of virtualized MiVoice Business • Isolation of individual and multiple MiVoice Business units from other instances through use of native VLAN configurations. • Associated and individual media services on separate servers
MiVoice Business Express	A combined Unified Communications and Collaboration package that runs in a VMware virtualization environment, providing: • Call Control via MiVoice Business Virtual • Unified Communications and Collaboration in MiCollab • Border gateway via MiVoice Border Gateway • Single OVA package, scalable through predefined deployment configuration settings

Table 7: Architecture components

COMPONENT	CONTEXT AND DEPLOYMENT DETAILS
MiVoice Border Gateway	MiVoice Border Gateway is a specialized application proxy supporting SIP, MiNet, and web protocols. Some of the key functionality provided by MiVoice Border Gateway includes: • Teleworker service for connection to remote SIP and MiNet end-points • Session Border Controller (SBC) functions and SIP trunk proxy for connection to external third-party SIP providers. • Web proxy for externally connected devices such as MiCollab mobile clients and softphones, management access, and access to LAN-based applications. • With Secure Recording Connector (SRC) - deployed on a per-customer basis. Customers can use SRC OR border gateway functions (they are mutually exclusive). Information about use with SRC is included in the *Mitel Contact Center Blueprint*.
Session Border Controller	This is the access point into the SIP Trunk service provider for network isolation. The MiVoice Border Gateway is used in a similar manner for customer and service provider connections.
MiCloud Management Gateway	MiCloud Management Gateway is a Mitel virtual appliance that provides specialized 1:1 NAT capabilities to support management access from the Service Provider domain to multiple Customer domains.
MiCollab	MiCollab unifies Mitel applications in an easy to use, cost effective communications solution. Users have a single point of access to all their Mitel applications through the My Unified Communications portal, a web-based interface. MiCollab provides co-residency of applications to support: • MiCollab Client Service • MiCollab Audio, Web, and Video Conferencing • MiVoice Border Gateway • MiCollab Unified Messaging
MiCollab Client Service	MiCollab Client Service is an application in MiCollab that provides presence information for all UC users. It also provides PC softphone and Mobile softphone clients.
MiCollab Client	The MiCollab Client connects to the MiCollab Client Service, part of the MiCollab server. It provides telephone presence and dialing capabilities for users. The MiCollab Client is used as a separate client with a hard phone, with the PC softphone, and with the mobile softphone. • Static softphones within the customer network must be registered with the MiCollab Client Service directly on the customer LAN. • Mobile softphones outside of the customer network must be registered with the MiCollab Client Service via the external Teleworker MiVoice Border Gateway. • Mobile softphones registered via the MiVoice Border Gateway may continue to consume Internet connection bandwidth when used within the customer premises. • Includes MiTeam collaboration application for chat, white-boarding, and video.
MiCollab Audio, Web, and Video Conferencing	MiCollab Audio, Web, and Video Conferencing is a Unified Communications Conference Unit within MiCollab that provides the ability to provide internal and external conferences of one or many users for voice, video, and presentation.

Table 7: Architecture components

COMPONENT	CONTEXT AND DEPLOYMENT DETAILS
MiCollab Unified Messaging	MiCollab Unified Messaging is a Unified Communications voice mail application within MiCollab. Features include: • Voice mail • Text to speech when integrated with e-mail • E-mail notification of voice mails • Auto-attendant and voice recognition (available as an add-on feature) • Visual voice mail
MiCollab Speech Auto Attendant	MiCollab Speech Auto Attendant is a feature in MiCollab Unified Messaging to provide automatic routing of calls based on spoken commands or dialed digits. MiCollab Speech Auto Attendant is only available as a stand-alone application, or as an optional add-on when used with MiCollab.
Mitel Open Integration Gateway	Mitel Open Integration Gateway provides a proxy for connection to Customer Relationship Management (CRM) business applications, including integration with: • MiVoice Integration for Salesforce • MiVoice Integration for Google • MiCloud CRM Integrations Mitel Open Integration Gateway can also be used by customer-specific applications for better integration of UCC to business operations; for example, call handling, click to dial, and so on.
MiContact Center Business	MiContact Center Business is a single or multi-tenant contact center that, using MiVoice Business call processing, provides call and multimedia contact handling. MiContact Center Business integrates with: • MiCollab Client • MiVoice Integration for Salesforce • MiContact Center Outbound • MiVoice Business Reporter • MiVoice Call Recording
MiVoice Call Recording	The Mitel call recording solution provides core voice call recording and quality monitoring that can be deployed for general business users and contact center agents.
MiVoice Business Reporter	MiVoice Business Reporter provides Customers with business communications usage reporting and optional cost analysis for departmental attribution.
MiVoice for Skype for Business	MiVoice for Skype for Business enables Mitel call control, natively launched from Microsoft Skype for Business.
MiCloud CRM Integrations	MiCloud CRM Integration enables Mitel call control, natively launched from many of the most common Customer Relationship Management applications.

Table 7: Architecture components

COMPONENT	CONTEXT AND DEPLOYMENT DETAILS
Oria	Oria is a tool for provisioning users and settings on MiVoice Business and MiCollab applications. Oria provides capability for: • Service providers to provision customers, including initial provisioning from Active Directory (by converting an LDIF file for bulk import). • Resellers to provision customers from service provider templates • End-customer self-service • End-customers can be granted access to specific aspects of their configuration information. • End-customers can be granted privileges to customize aspects of their phone service. • Different management levels are provided for users and end-customer administrators. The level of provisioning and user capability is defined in Oria templates, from full access to limited and targeted access.
Native management	There are direct management interfaces to the individual products, including: • Individual applications • Network and virtualization infrastructure • Call control engines. These interfaces are used to initially provision and connect applications prior to connection via Oria, e.g. to configure resiliency and single sign-on access.
Business applications/Virtual business applications	Customer-specific business applications that the UC system may need to be aware of, or to integrate with. It may include applications such as: • E-mail, and integration with voice mail • Customer database • Directory services • Web services

Table 7: Architecture components

COMPONENT	CONTEXT AND DEPLOYMENT DETAILS
Mitel Performance Analytics Server and Probe	The Mitel Performance Analytics application uses a virtual Probe that collects fault and performance data for Mitel components and selected network devices. Probe is a diagnostic tool deployed at any location in the network where specific monitoring is required. • For service providers, a publicly-accessible Mitel Performance Analytics Server needs to be deployed for this service. • For on-premise or Enterprise deployments, the hosted public server portal may be used. The Probe reports on product integrity and performance: • Collects call quality information from the individual MiVoice Business controllers and generates alarm indicators when quality falls below specified thresholds. • Monitors the activity of the architecture components, including network equipment, and provides alarm indications when units are out of service or reaching performance thresholds. • Can be deployed within individual customer networks when more specific monitoring is required. • Can be deployed in the service provider network to monitor product integrity, performance, and user call quality from individual MiVoice Business controllers. • Reports are sent to a central Mitel Performance Analytics cloud server, via the Internet connection, or to a locally provisioned Mitel Performance Analytics server with the service provider. Further details about Mitel Performance Analytics components are available from Mitel OnLine.
Internet	Provides default connections between multiple carriers and networks, and global access to services. The Internet provides a best-effort service with varying bandwidth connections. Some global connections may offer high bandwidth connections while others may have more restricted options. Also referred to as Over-the-Top (OTT) connections for services that are able to traverse multiple, different carrier networks. Used for: • Public User Gateway access • Management Portal global access • License confirmation • Simple set deployment with Mitel Redirection and Configuration Service server • General Customer Web access, including connections to public services with Mitel Open Integration Gateway
MPLS	A dedicated and secured network connection from the hosted site to the customer site. It also provides: • Isolation from the public network • Isolation between customers • Cross-connection for multiple customer sites as a single network • Ability for the Network provider or carrier to provide QoS and Service Level Agreements (SLA) on data delivery that cannot be guaranteed over the Public Internet

Table 7: Architecture components

COMPONENT	CONTEXT AND DEPLOYMENT DETAILS
SIP Trunk Provider	The SIP service provider provides IP connected SIP trunks, either for the UC service provider, or for the customer, depending upon configuration of the network. It includes: • DDI/DID numbers that are hosted or assigned by the SIP service provider • SIP to PSTN access • IP Network isolation via an SBC • Billing • Emergency service location information
Teleworker (Public Network)	This is connectivity for Teleworker phones. This access is typically over a Public Internet connection, or over a publicly-accessible network.
PSTN	The Public Switched Telephone Network is the existing legacy voice network using time and circuit switched technology.
Mitel Redirection and Configuration Service	Public Internet accessible server that allows simple deployment of phones for Internet/Over-the-Top (OTT) deployments by providing redirection information to the service provider user gateway.
MiCollab Redirect Server	Used to simplify installation and configuration of MiCollab on mobile phones.

MiCloud Business Multi-Instance architectures

MiCloud Business Multi-Instance architectures make use of the MiCollab Client and MiContact Center multi-tenant capabilities.They are ideal for service providers who cater to smaller businesses, such as those with fewer than 50 users.

In this section:

Small Business (SB) architecture

The MiCloud Small Business architecture is a straight-forward solution for service providers offering voice-centric deployments with a light level of UC attachment to end-customers. The SB architecture easily scales to multiple instances and customers, ideal for a small business where there are typically fewer than 50 users per customer.

The SB architecture uses a common address space for the service provider, and is essentially a flow-through model from SIP trunks to end-users. This type of deployment is commonly referred to as an Over-the-Top (OTT) network deployment (deployed over the public Internet), although it can be designed to use MPLS, if desired.

MiVoice Border Gateway functionality is an integral part of network security in this solution. A group of MiVoice Border Gateways isolate the SIP trunk connection point. User isolation to the public network (the Internet) is provided by an additional group of MiVoice Border Gateways. Customer isolation from the public network is done using standard Internet access firewalls and Network Address Translation (NAT).

Customer management is provided by a publicly-accessible management portal, or directly through the service provider.

For emergency location details for this architecture, see the *MiCloud Engineering Guidelines*.

The following sections provide further information for evaluating the SB-MT architecture to determine if it is a suitable solution for a service provider's target market segment and a specific end-customer's needs.

Small Business sales guide

The multi-tenant architecture is designed for cost effective delivery of voice and light UC services appropriate for the small business market. The architecture extends to larger customers, although the advantages of multi-tenant applications are less compelling. The notable exception is for large customers comprised of many small remote sites where the use of globally reachable public addresses makes the multi-tenant solution much more compelling.

The SB architecture provides services ideal for service providers delivering voice and multi-media services to:

- Commercial tenants, including retail shopping malls, industrial park offices
- Franchise businesses
- Seasonal outlets allowing rapid turn up, and down, of customers
- End-customer deployments that can be simplified to standard templates and require minimal per-customer customization

The SB architecture is optimized for voice-centric services while minimizing infrastructure costs per customer.

Typical SB architecture end-users are:

- Voice-centric users
- Users with minimal or light UC functionality requirements (telephony presence) and UC Client without requirements for rich collaboration tools for audio, web, and video conferencing.

End-customer configurations provided by the service provider will be very similar, including numbering plans. Configuration differences will be the assigned DDI/DID numbers and the number of users. The SB architecture lends itself to simple templating of users with a limited range of devices. The configuration and setup of the devices can be staged, allowing a customer to “plug and play” phones when they arrive on-site.

Small Business architecture

The SB architecture can be split into voice-centric components and Unified Communications (UC) components. The main voice components are the MiVoice Business Multi Instance servers and the virtualized MiVoice Business instances that run on the MiVoice Business Multi-Instance platform. A media instance associated with each MiVoice Business instance provides access to media services such as Music-on-Hold, Conference, and embedded voice mail capabilities.

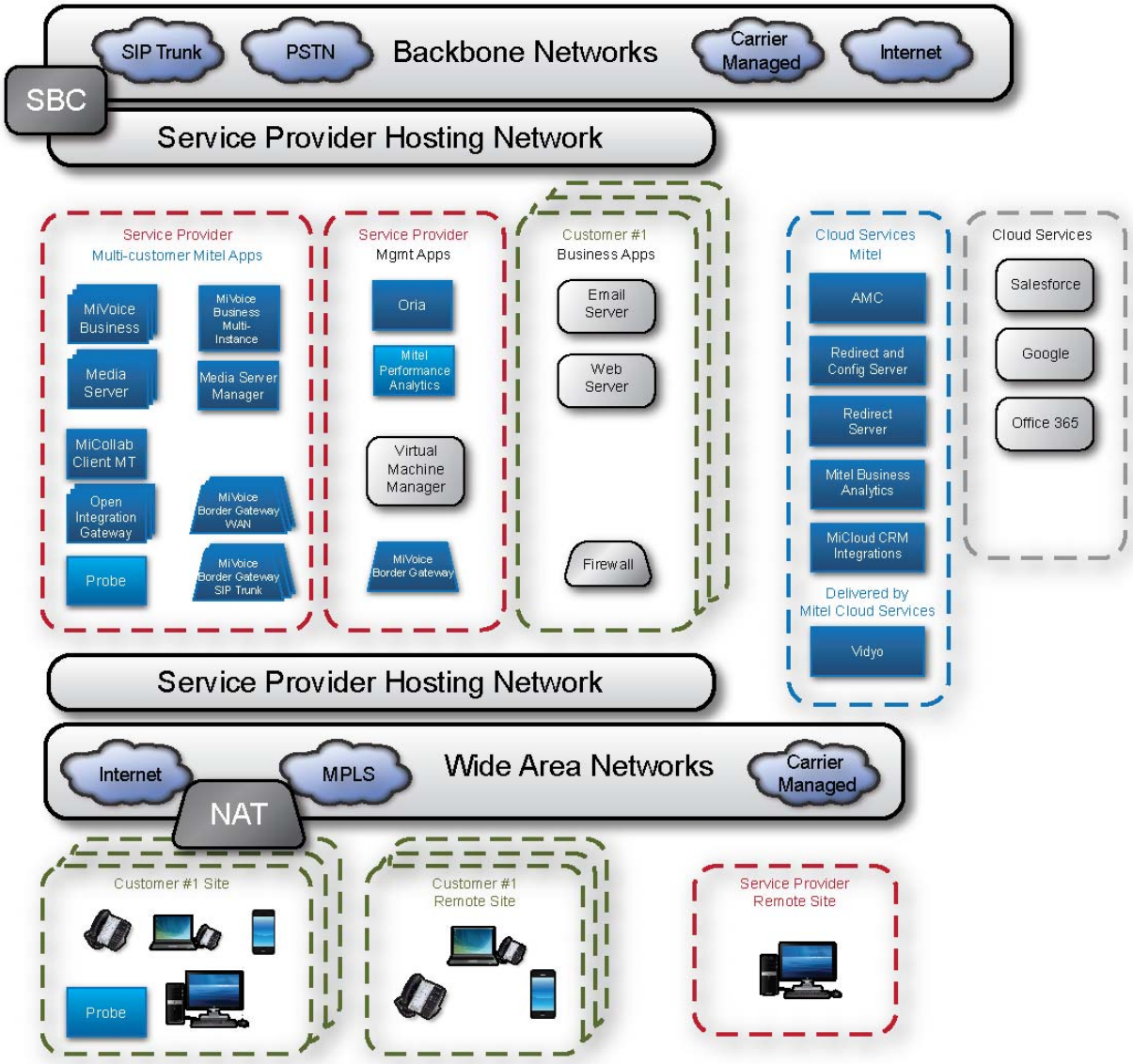
To support larger deployments, multiple instances of the multi-tenant applications may be required, such as multiple MiVoice Business Call Managers and Media Servers. The MiVoice Border Gateways support connectivity to user-facing WAN networks for Teleworker and web proxy services, and connectivity to carrier backbone networks for SIP trunk connections. Multiple MiVoice Border Gateways are shown in Figure 7 to indicate these different services. The specific deployment for MiVoice Border Gateways depends on the network configuration within the hosting environment and the required capacity to handle the traffic load. Multiple

instances of Open Integration Gateway (OIG) are shown based on the requirement of one OIG per customer.

Unified Communication applications are provided by a MiCollab Client Multi-Tenant server. The MiCollab Multi-Tenant server handles UC connectivity for multiple customers. The server allows connections from users with standard phones, plus mobile devices, soft phones, and smart phone devices. Connections are established over PSTN networks, cell phone networks, and public Internet connections, allowing multiple call-paths for mobile end-users.

Figure 7 includes several optional third-party applications that service providers may choose to offer as part of a complete service offering. Vidyo and MiCloud Business Analytics are described in later sections.

Figure 7: Small Business architecture



Small Business considerations

The following sections highlight some considerations that apply to the SB architecture.

Small Business networking considerations

All end-customer access to the multi-customer applications is made through network-routed addresses; however, this does not preclude the use of MPLS or carrier-managed networks with appropriate configuration of the customer access gateway.

The MiVoice Business Multi Instance server may be configured for VLAN or non-VLAN operation. Either way, the MiVoice Business Multi Instance server and the related multi-customer Mitel applications must be reachable within a local area network. With this proviso, the architecture supports the use of VLAN mode, provided that all applications reside in the same VLAN. When the MiVoice Business Multi Instance server is used in VLAN mode, the associated LAN switch must apply Layer 2 tagging at the port level to provide access from the untagged LAN to the tagged LAN.

For detailed information, see the *MiCloud Engineering Guidelines*.

Small Business component interactions and dependencies

Multi-tenant applications typically offer a limited set of capabilities relative to the single-tenant application. MiCollab Client Multi-Tenant offers the subset of MiCollab capabilities supported by MiCollab Client. As a MiCollab single application deployment, MiCollab Client supports higher capacities than are available with the multi-application mode.

For the multi-tenant application, component constraints include:

- MiCollab must be deployed in co-located mode. The MiCollab database does not support tenanting
- MiCollab USP is not supported in MiCollab Client Multi-tenant. MiCollab USP supports Flow Through Provisioning only to a single MiVoice Business cluster. MiCollab can participate in a single data sharing scope. Oria provides configuration and provisioning for both Mi-Collab Client and the associated MiVoice Business instances.

There are a number of dependencies and interactions that must be considered when deploying and scaling the SB architecture. Most of the dependencies are related to scale and therefore need to be considered by the service provider deployment, rather than at the end-customer. For the details, see “Small Business management considerations” on page 41.

Small Business supported phone and end-user device types

The phone types for this architecture are restricted. This is primarily to ease deployment and to allow use of simpler templates through Oria.

Supported phones include:

- MiCollab MiNet soft phones
- Mitel proprietary phones: MiVoice 5330, MiVoice 5340, MiVoice 5360, MiVoice Business Console (The legacy 5550 TKB is not supported)

- MiVoice Business Console
- Mitel PC Softphone and Mobile Softphone for UC attachment.
  Note that additional licenses may be needed for these devices.
- A limited number of SIP ATA devices for connection to external interfaces such as Public Address systems and door opening systems.

For details about end-user devices, see “Users and devices” on page 113.

Small Business Quality of Service considerations

Quality of Service (QoS) needs to be provided end-to-end from the user phone through to connection to the service provider, and QoS settings considered on the Public Network connections, the customer access connection, and the customer LAN.

Where the end-customer and the service provider share a common Public Network, the service provider may provide traffic shaping and priority queuing through Service Level Agreements to ensure that priority-marked packets are treated in an appropriate manner.

Peering arrangements between peer-to-peer Border Gateway Protocol (BGP) connected Public networks may also allow QoS commitments to be honored between these networks, but not over the Public Internet. Although connections over the Public Internet are possible, SLAs and QoS are not typically honored due to uncertainty of the connection route over different networks.

It is recommended that end-Customers provide a means of enabling QoS and queuing mechanisms within their own network. It may also be necessary to provide a dedicated voice connection; by providing the necessary bandwidth and avoid access congestion with basic Internet routers, for example. Traffic shaping units can also be included in the customer connection, either by the Public Network Provider, or installed on the customer site. These effectively throttle unmarked download traffic to provide sufficient bandwidth for voice traffic.

Connections that use the Public Network infrastructure are called Over-the-Top (OTT) deployments, since they use the Public IP addressing scheme, rather than dedicated connections that are customer and network specific.

For further details about QoS settings see the *MiCloud Engineering Guidelines*.

Small Business management considerations

The end-customers’ and service provider’s networks are totally isolated, with potentially overlapping IP addresses. Security boundaries are used to limit end-customer access to the service provider’s network, even though the service provider hosts equipment on behalf of the end-customer. Providing easy network access to one customer risks exposing access to other customers’ configurations.

User configuration and settings are accomplished using Oria, which works with MiVoice Business, MiVoice Border Gateway, and MiCollab.

Some UC components must be configured and operational before Oria is used for additional configuration or management. A successful deployment requires following the correct

component deployment sequence. For deployment details refer to the *MiCloud Business Solution Small Business Deployment Guide*.

For simplification of management of the SB solution, it is recommended that FQDN names be used to address the operational interface for the different application hosts, rather than explicit IP addresses. This allows FQDNs to be used across NAT and proxy boundaries, if needed. It also requires that a local DNS server be available within the Service Provider network.

The FQDN information in Oria is shared with multiple applications, so the FQDNs must represent the operational interfaces for the application. MiVoice Business Multi Instance must be enabled for customer-facing management access. Management and application operational access is done using the same interface. The DNS server must map the FQDNs for the applications to the operational interface. The operational interface is used for client-server and user access. The management interface is used to manage the application. In this case, both are associated with the same IP address.

Oria management portals

Oria provides management access through two portals:

- Service Provider Portal
- Customer Administration Portal

Oria provides user management through the management portals. The Service Provider Portal is used by the Service Provider to manage its end-Customers. The Customer Administration management portal has a public IP address that can be reached globally as a common access point for end-users, administrators, and the service provider.

The Oria management portals are configured with user templates that have increasing levels of access and configuration rights. Templates can be configured for users and customers, the service provider, as well as for resellers.

Oria for Multi-tenant architectures

Oria is a new feature of Oria that allows quick creation of new customers, including the necessary licensing structures, using “blueprints” that you define. Oria is used with Oria File Server. Oria and Oria File Server each uses its own server. Both are installed as blades in MSL.

Note: Oria is currently available only on architectures based on MiVoice Business Multi Instance built on MiVoice Business Multi Instance.

Blueprints are defined with the following:

- MiCollab
- One or more MiVoice Business instances, including optional resiliency
- Pointer to a golden database
- All licensing: Licenses must be pre-purchased and available.

Oria creates and licenses the new MiVoice Business instances and clusters them, installs MiCollab, and sets them all up in the ULM. It then registers the platforms in Oria and restores the specified golden database.

Management access for other applications

Separate management access is also required for the service provider, independent of the Oria management portal, for the following:

- Remote access to the hosted address space for the service provider (VPN access to manage the network, applications, and components)
- SMTP forwarding for required equipment alarms
- Mitel Performance Analytics integration for voice quality and equipment alarm monitoring

Small Business addressing considerations

The service provider address space is a self-contained flat network, and is totally isolated from the customer networks.

Customers have their own local networks and private addressing schemes, many with overlapping IP addresses.

The service provider provides a public IP address on the user gateways. Users connect to the user gateways using their own public IP address provided by the carrier, or a statically assigned IP address at the customer router. The customer router also provides the network address translation from internal LAN address to external public address. The MiVoice Border Gateway translates customer public IP addresses to appropriate internal service provider addresses.

Management access for the end-customer is done through a public IP address associated with the service provider. The management portal authenticates access and translates connections to appropriate internal service provider addresses. If the service provider deploys a Mitel Performance Analytics Server in the hosted address space, an additional public IP address is required to allow the Mitel Performance Analytics Probes to connect to the central hosted server.

Small Business end-customer, service provider, and network considerations

A careful review of all the relevant end-customer, service provider, and network considerations will support a successful deployment. The following sections are not exhaustive, but are intended to provide guidance for reviewing this architecture and making the decisions required for a successful deployment. For details, see the *MiCloud Engineering Guidelines*.

End-customer considerations

The following items should be considered for end-customers.

- Firewall and NAT capabilities for network isolation are defined
- Sufficient bandwidth exists, or a dedicated connection has been identified
- The carrier network is the same as the service provider’s, or there is a peering agreement between the two carriers

- Local DHCP or limited local network capabilities exist
- If local PSTN access is needed, the SMB-LD solution has been reviewed as an alternative architecture
- Requirements for non-standard interfaces (example: SIP ATA for door openers) have been identified and cross checked with the Mitel SIP Center of Excellence.

Network and carrier considerations

The following items should be considered for the network and carrier portions of the solution.

- QoS settings are supported and honored, and different SLAs are defined if necessary
- Service provider has external access to AMC for license verification
- Service provider has identified an e-mail forwarder for alarms and notification
- SIP Trunk provider interoperability has been reviewed
- SIP device interoperability has been reviewed
- Public DNS registrations for MiVoice Border Gateways are defined
- Phone pre-provisioning strategy is defined or a redirection server requirement has been identified
- Inter-data center connectivity for resiliency is mapped
- Backup storage and scheduled identified
- An ongoing monitoring and alarm reporting strategy is in place
- MiVoice Border Gateway clustering strategy has been defined
- If the deployment needs VLANs for customer isolation, the SMB-LD solution has been reviewed as an alternative architecture
- The network is redundant at all levels and is tested regularly (example: VRRP, HSRP, MSTP, LACP)
- The same carrier network is used between service provider and customer or a peering agreement between network carriers is in place
- Public IP address requirements are identified (IPv4 is in short supply)
- Internal IP address map is planned

Note: In the SB architecture, the MiVoice Business Multi-Instance can be deployed with or without VLANs enabled. If VLANs are enabled, they are used for scaling and IP usage reduction and not for individual customer network isolation. All customer instances reside in a single service provider address space. VLANs may be used for convenience, rather than as a deployment requirement.

Service provider considerations

The following items should be considered for the service provider deploying the solution.

- Remote Over-the-Top (OTT) management access requirements are identified

- If the OTT model is insufficient for some deployments, MPLS is used, or the SMB-LD architecture has been reviewed as an alternative solution architecture
- Performance, instances per server, and traffic considerations for server scaling are defined
- The licensing model has been reviewed and planned
- The solution has been reviewed to ensure compliance with local regulations for security and privacy of user information
- Billing information and process is defined
- E911 calling and emergency location requirements, such as individual user DDI/DIDs, have been considered and planned
- Risk plans relative to turnover of personnel and access security updates are in place
- Backup and recovery policies are defined
- Pre-deployment “sandbox” is available for pending updates
- The inclusion of Windows and VMware components and respective licensing is planned
- Data center considerations including power, geo-location, cooling, security, and access are defined
- The scope of the UC applications and voice services have been confirmed
- Local maintenance and provisioning staffing requirements are understood
- Remote access for maintenance staff is planned
- SIP Trunk service provider and scaling requirements are determined
- Billing model from the SIP service provider is defined
- A network configuration plan has been designed to ensure the ability to handle overlapping customer address space, using local customer NAT
- Pre-provisioning requirements for end-customer devices have been identified
- Strategies are in place for overall service resiliency and redundancy, considering any single points of failure, including the physical building
- A voice mail plan is in place for using embedded per-instance voice mail (no off-board voice mail)
- The solution is designed to support customer deployment templates
- Engineering guidelines and limits for the underlying platforms have been read and understood, including: MiVoice Business, MiVoice Business Multi Instance, MiVoice Border Gateway, and MiCollab. See also the *MiCloud Engineering Guidelines*.

Small Business relative strengths and limitations

Table 8 identifies the strengths and limitations of this architecture relative to the other MiCloud Business Solution architectures.

Table 8: Small Business strengths and limitations

STRENGTHS	LIMITATIONS
• Voice service provider is not linked to carrier network • Self-contained deployment • Over-the-Top (OTT) Internet model (with the option of using MPLS) • All devices look like Teleworker, using public network or Internet access • Connection to external cloud business services • Customer isolation, overlapped customer address space • Simple phone provisioning • Aimed at small office deployments, less than 50 users, but can be scaled • User and Customer-accessible management portal, with service provider restriction of access • Simple billing	• Limited QoS support • Connections to customer network are over the public network or Internet (this is not a mandatory restriction) • Primarily voice-centric deployments for small business • Limited UC integration and capabilities • Restricted to a limited set of phone devices • Additional MiVoice Border Gateway is needed for application support, different Public IP Addresses

Customer network-specific deployments are also highlighted in the MiCloud Business for Service Providers Solution training.

Small Business Virtual

For the typical Small Business (SB) deployment, the solution comprises MiVoice Business Multi Instance and the associated Media Server deployed on ISS, with MiVoice Border Gateways on ISS for higher capacity. MiCollab Client Multi-tenant and Mitel Open Integration Gateway (OIG) are deployed on virtualized servers for improved resiliency, based on VMware High Availability (HA) capabilities. With platform variations, a fully virtualized deployment is supported as described below.

The multi-tenant architecture is supported with all platforms deployed on a virtualized infrastructure, such as is available from an IaaS-provided data center. The SB Virtual architecture is shown in Figure 8.

This is the same multi-tenant architecture as for the SB architecture. The only differences are in the platform packaging. In SB Virtual, multiple instances of MiVoice Business Virtual are deployed in place of the MiVoice Business instances in MiVoice Business Multi Instance (that is, the MiVoice Business Call Manager and Media Server). Aligned with deployment in an IaaS virtualized infrastructure, MiVoice Border Gateway Virtual is substituted for the MiVoice Border Gateway on ISS. Component constraints are the same as described for the SB architecture.

Compared to the SB architecture, there are no significant differences in the service or management capabilities. However, for service provider operations staff, the MiVoice Business Multi Instance management interface is no longer available to manage the MiVoice Business instances. In the SB Virtual case, operations staff access the MiVoice Business Virtual instances directly for any configuration or customizations not handled by Oria.

The capacity and scaling of the architecture is discussed in the *MiCloud Engineering Guidelines*.

Figure 8: SB Virtual architecture

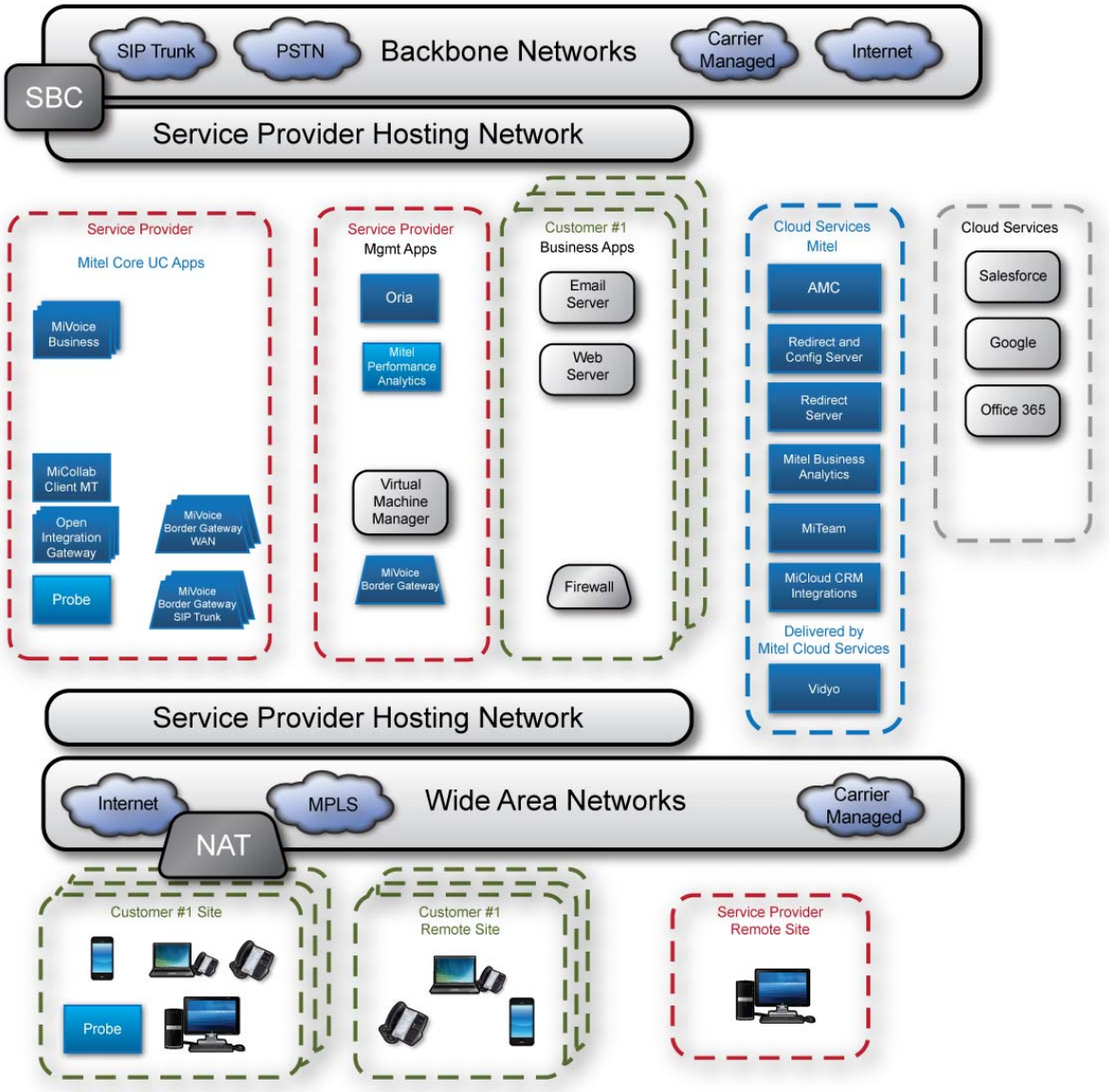


Table 9: Comparison: MiVoice Business Virtual vs. MiVoice Business MiVoice Multi Instance

	MIVOICE BUSINESS VIRTUAL	MIVOICE BUSINESS ON MIVOICE BUSINESS MULTI INSTANCE PLATFORM (ISS)
Capacity	Lower capacity due to: • the overhead of virtualization • the underlying specifications of the hardware	Provides higher capacity for applications, with a comparable resource footprint

Table 9: Comparison: MiVoice Business Virtual vs. MiVoice Business MiVoice Multi Instance

	MIVOICE BUSINESS VIRTUAL	MIVOICE BUSINESS ON MIVOICE BUSINESS MULTI INSTANCE PLATFORM (ISS)
Operational/ installation ease	Much easier to install and maintain	More hardware setup and maintenance
Resource footprint		Lower resource footprint for similar capacity
Voice mail	Number of internal voice mail boxes is restricted	
Cost	Fewer physical servers needed	No VMware software expense

MiCloud Business Virtual architectures

MiCloud Business Virtual architectures are based on MiVoice Business Virtual and MiCollab Virtual, on a VMware infrastructure. In the SMB case, MiVoice Business Virtual and MiCollab Virtual are packaged together in one easy-to-install OVA.

Small Medium Business Low-density (LD) UCC architecture

The SMB-LD architecture is a deployment suitable for service providers to deliver voice-centric services to small and medium-sized business customers. The Small Medium Business, Low-density UCC combines a cost-effective voice platform with the ability to add rich UCC services for a limited number of high-end customers. SMB-LD is based on the MiVoice Business Multi Instance platform.

Service providers can use this architecture to offer end-customers a choice between voice services, with or without UC attachment. These small and medium business customers typically have fewer than 250 employees (users), although the solution can be scaled higher if needed. The solution is recommended for service providers offering voice services to the majority of customers and adding collaboration capabilities for a subset of customers; this is referred to as “low density” collaboration services.

The deployment uses a single flat address space for the service provider with local isolation of the customers’ networks. A MiVoice Border Gateway or session border controller (SBC) provides network isolation at the at the edge of the customer network. This MiVoice Border Gateway, or SBC, provides connectivity to external SIP trunk providers and also provides connectivity for customer Teleworker end-users.

Connectivity to the customer's remote networks is provided over a dedicated MPLS circuit. Extending the customer network into the service provider environment, using MPLS connections removes any need to add a border gateway to isolate the end-customer networks from the hosted network. Extending the customer network into the hosted site allows increased UC functionality, compared to connections via a gateway. Extending the customer network also allows tighter integration with existing customer applications and other hosted services, as well as connections to on-site equipment, such as a local trunk breakout.

Customer management can be provided via different methods, including:

- Using management portals into the service provider space
- Using a customer-accessible management portal
- Management directly from the customer network

Each customer-hosted network is isolated from other customers, and customer network to customer network connections are not available. Customer to customer connections are permitted only via the SIP trunk service provider and are charged accordingly.

Each user is assigned a unique DDI/DID number. The business, or end-customer, may be assigned additional business numbers as required. Unique DDI/DID numbers allow for per user billing and assignment of location information with the SIP trunk service provider.

For emergency location details for this architecture, see the *MiCloud Engineering Guidelines*.

The following sections describe the SMD-LD architecture:

SMB-LD sales guide

The Small Medium Business, Low-density UCC architecture provides services ideal for service providers delivering voice services to:

- Commercial tenants, including retail shopping outlets, industrial park offices
- Franchise businesses
- Sales or support businesses with mobile employees supported by back office staff
- Small businesses requiring integration with cloud-based tools such as Salesforce and Google

Typical SMB-LD users are:

- Voice-centric users that require a dedicated hosted connection, for example QoS support
- Users who need mobility and presence features including internal extension dialing
- Users that require rich UCC applications, but where the service provider offers this functionality as a limited deployment to premium customers
- Users with light attachment, or interaction, with existing business tools and applications
- A service provider that offers full UCC capability but to a limited deployment of customers

End-customer configurations deployed by the service provider will be very similar in nature, including numbering plans. Configuration differences include the assigned DDI/DID numbers and the number of users. To simplify deployments, service providers can template their SMB-LD offer into multiple deployment models, ranging from voice-only up to a light level of UC integration.

SMB-LD architecture

The SMB-LD architecture is a voice services deployment with or without Unified Communications and Collaboration (UCC) options. The voice services are provided by MiVoice Business instances running on the MiVoice Business Multi Instance platform. UCC services are provided by the MiCollab Virtual application platform running on a VMware infrastructure.

A service provider offering full UCC capabilities must provide a dedicated network link to the customer, such as with MPLS. The SMB-LD solution allows full UCC deployment for customers that require it, possibly charged as a premium, in addition to basic voice services.

Customer segregation is achieved through use of VLAN technology and use of a common VRF router onto the MPLS carrier network.

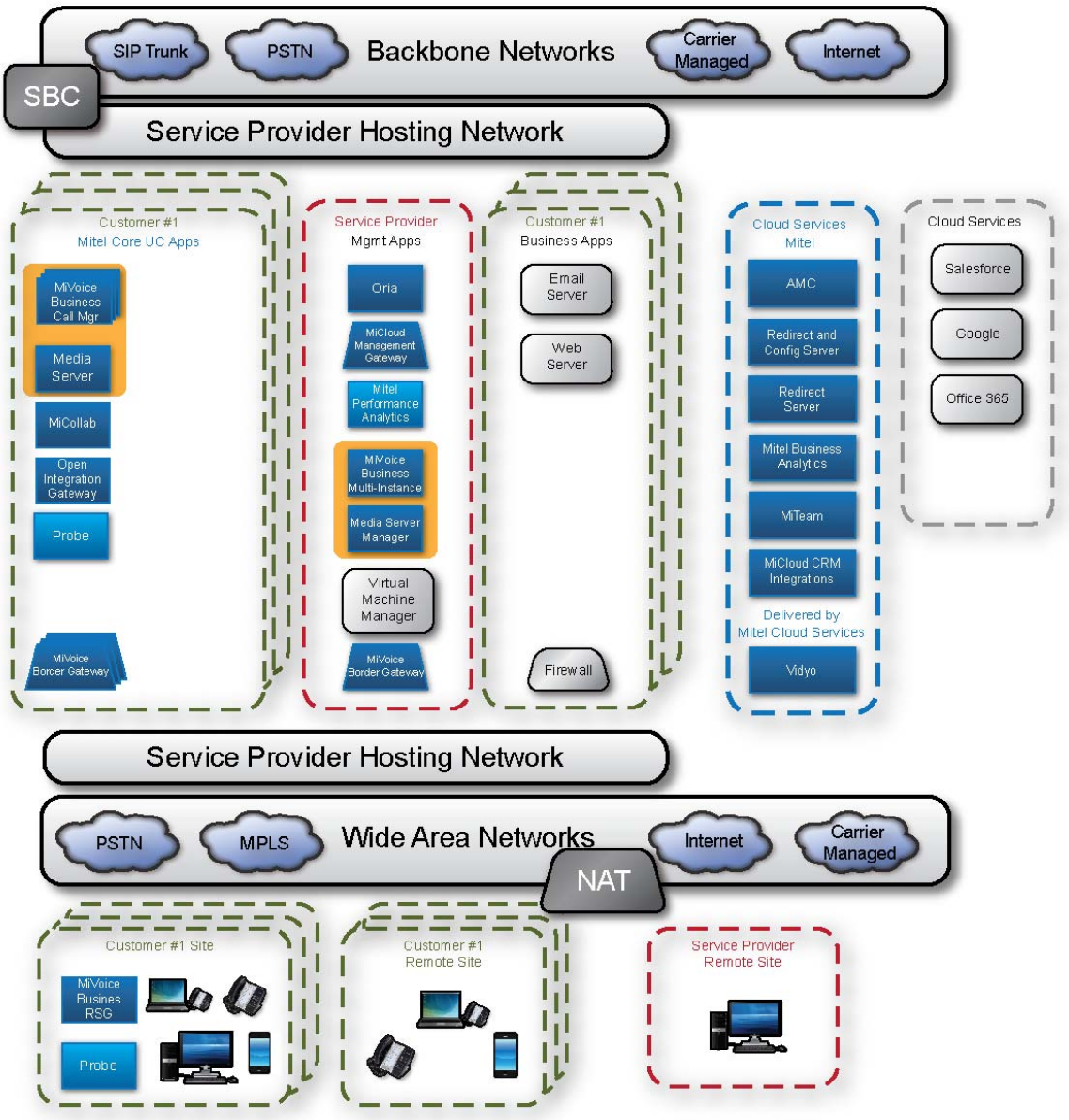
Because the SB architecture and the SMB-LD architecture both use the MiVoice Business Multi Instance platform, it is possible to combine both architectures onto the same hardware, while keeping the architectures logically separated. This separation is achieved by using unique VLANs per customer. The MiVoice Business Multi Instance platform must be operating in VLAN mode, with the management address on the untagged VLAN, the shared instance addresses on a common VLAN and the isolated instances on unique VLANs. For the other platform components, their deployment is as per the relevant architecture. The management platforms, Oria and Mitel Performance Analytics, can span customers in both architectures. This deployment is referred to as a hybrid architecture.

Rich UCC functionality is provided by a dedicated MiCollab Virtual instance per customer. Each MiCollab is dedicated to one customer, and is not shared. The use of MPLS allows direct connection to the MiCollab Virtual without resorting to Over-the-Top (OTT) techniques, although a per-customer MiVoice Border Gateway can provide Teleworker and mobile device access on a per-customer basis.

Each customer also has their own dedicated MiVoice Border Gateway, which can be used to provide access to SIP Trunks, Teleworker users, and SIP/UC users. Additional units can be used for scaling and resiliency.

Management access is provided by a common Oria portal within the service provider space, plus a dedicated per customer management portal.

Figure 9: Small Medium Business, Low-density UCC architecture



SMB-LD considerations

Considerations for the SMB-LD architecture include management access, application programming and licensing interactions. There are also scaling considerations based on number of users and the number of Public IP addresses required to handle the number of customers.

The SMB-LD deployment allows full UCC connectivity for those customers that require it, without the service provider having to provide it to all customers.

The MPLS connection allows access to other hosted applications, and provides the capability for a local trunk breakout MiVoice Business unit. Use of an MPLS connection also allows SLA and QoS settings to be honored across the carrier network.

Component interactions and dependencies

Note: Component constraints are the same as for Medium-Large Business.

The SMB-LD architecture is intended to cover the Small to Medium business market, although it can scale to a higher number of users and devices. The main factor that limits the scaling is the number of users that the MiCollab Client Multi-Tenant Service component is capable of handling. The number of MiVoice Border Gateways and MiVoice Business are also driven by the number of users. Typically the deployment will deal with up to 250 users and associated devices, although this can scale up to thousands of end-users.

The core components of the architecture are the MiVoice Business and MiVoice Border Gateway Virtual instances. MiVoice Business and MiVoice Border Gateway Virtuals are needed to provide voice connectivity, even if no other applications are required. Use of MiVoice Business Multi-Instance allows high density of deployment and a cost-optimized solution for those customers that require basic voice telephony.

The SMB-LD architecture allows the deployment of a MiVoice Business 3300 ICP remote trunking gateway at the customer site because the end-customer network is directly connected to the hosted site, rather than via NAT and a public gateway. Programming the remote trunking gateway requires manual interaction; it cannot be provisioned via Oria. Manual programming creates a risk of database synchronization conflicts. Consult Mitel Professional Services before deploying a remote gateway.

The MiVoice Border Gateways provide the following functions:

- SIP Trunk connections to SIP service provider
- Teleworker phones with Mitel proprietary phones
- UC connections for mobile UC clients and SIP softphones

The service provider must consider the number of IP addresses to be provisioned on the MiVoice Border Gateway Virtuals across a number of customers. The service provider requires multiple public IPv4 addresses for end-customers.

For a voice-only deployment without Teleworker phones, the MiVoice Border Gateway Virtuals are the only virtualized product within the deployment, used only to connect to a SIP trunk service provider. In this case, an alternative to multiple MiVoice Border Gateway Virtuals is a third-party VLAN-aware SBC. The list of suitable third-party SBCs can be obtained from the Mitel SIP Center of Excellence (SIP CoE).

Where Teleworker users or UC functionality is needed, MiVoice Border Gateway Virtuals must be used to provide the necessary Application Level Gateway (ALG) functions between the public external and customer internal networks. Third-party SBCs do not work for these connections.

Inclusion of the MiCollab Virtual server provides access to the full UCC capability. The MiCollab server must be linked to the MiVoice Business for the customer deployment. The number of users and the type of users determine the scaling of the MiVoice Business and MiVoice Border Gateway surrounding infrastructure.

A MiCollab server must be deployed per customer for each customer requiring UCC capabilities. The tenanted MiCollab solution is not VLAN aware and does not work across multiple customer in this architecture.

Different voice mail deployments are possible, depending on whether the customer is voice-only, and whether MiCollab Virtual is deployed for UCC functions. If the customer is voice-only, then the MiVoice Business internal Embedded voice mail (EMEM) is used. If MiCollab Virtual is deployed, then the MiCollab Unified Messaging is used. MiCollab Unified Messaging provides additional UCC functions, including visual voice mail and e-mail integration. Different provisioning templates in Oria apply, depending upon whether the customer is voice-only or uses MiCollab capabilities.

The MiCollab Client can be associated with mobile devices such as smart phones and tablets. These mobile devices need to register through the customer MiVoice Border Gateway Virtual if full mobility outside of the business premise is required. The MiVoice Border Gateway must be scaled for these external connections.

Where there are MiCollab Clients external to the customer network, the MiVoice Border Gateway Virtual provides an additional Application Level Gateway (ALG) functionality that is not provided by a third-party SBC. Therefore MiVoice Border Gateway Virtuals are required with a UCC deployment.

Access to hosted cloud services, such as Salesforce and Google, is provided using a Mitel Open Integration Gateway Virtual application for each customer. A per-customer Internet connection is needed for this integration to work.

Supported phone and end-user device types

There are two different connection paths to consider for the SMB-LD architecture, the internal path within the customer network, and the external path via the Teleworker gateway.

With the SMB-LD architecture, the customer network is extended into the remote hosting site over a dedicated MPLS circuit. There are no gateways or breaks in the network. The MPLS connection is effectively transparent to the end-customer. As a result of this networking transparency, the customer can deploy any of the devices that are listed in “Users and devices” on page 113.

For the Teleworker-connected devices, there are some restrictions on the devices that can be supported. For the UC-specific softphones, some additional configuration is needed at the customer MiVoice Border Gateway Virtual to proxy through the MiCollab Client Multi-Tenant Service connections.

Quality of Service considerations

The use of an MPLS circuit means that the connection between the customer and the hosted site is managed. This connection can have SLAs applied to ensure timely delivery of voice and signaling packets.

DSCP values must be consistent between the customers' end-devices and the service provider's hosted equipment. Performance is improved if the customer also employs consistent DSCP markings in their network equipment. Recommended DSCP values are discussed in the *MiCloud Engineering Guidelines*.

Typically the data bottleneck is at the incoming connection at the customer premise, especially if this connection is shared with an Internet connection. Enabling QoS scheduling at the penultimate (next to last) router, at the provider edge, helps to ensure that voice and associated signaling are delivered to meet the required SLA.

For details, refer to the *MiCloud Engineering Guidelines*.

SMB-LD management considerations

The SMB-LD deployment can be managed in a number of different ways, and depends on how much autonomy the service provider wishes to provide to the end-customer. The initial configuration of the system also depends on whether the deployment is voice-only or includes UCC components.

As a basic management strategy, all of the components can be managed from their native interfaces. A web proxy at the customer MiVoice Border Gateway, or a dedicated VPN connection allows the service provider or reseller to manage the individual components on behalf of the customer, or the customer can have direct access to these native interfaces from inside their network.

The recommended service provider solution is to deploy the Oria management portal and provide templates. Different authorization profiles are created for different customers and users in those customers. The Oria management portal ensures that configuration information is correctly programmed across the different components.

Prior to using the Oria management portal, some manual configuration is required by the service provider, including licensing and enabling the MiVoice Business and UCC components, linking them together, and programming the VRF router and network VLANs. Instantiation and configuration of the virtual components also requires manual setup.

If the end-customer wishes a voice-only deployment, the Oria management portal can access the MiVoice Business management interfaces on the MiVoice Business Multi Instance server from within the service provider IP address space. Alternatively, Oria can access the MiVoice Business from within the customer hosted space, as described below, for UC inclusion.

For a voice-only deployment, the MiVoice Business Multi-Instance can provide access restrictions to the management interfaces of the customer MiVoice Business. For details on using this setting, see the MiVoice Business Multi Instance documentation.

A UCC deployment requires configuration from the customer's MiCollab server. The Oria management portal requires access to each customer's MiCollab server, MiVoice Business, and MiVoice Border Gateway Virtuals. Oria access is achieved via a per-customer 1:1 NAT/Router portal from the service provider address space.

For consistency, it is recommended that the 1:1 NAT/router function be used for all customer deployments, whether or not UCC is being provided. This requires that MiVoice Business Multi Instance be configured to allow management from the customer interface. Additional Access Control Lists (ACL) may be programmed to the MPLS/VRF router to prohibit access from Oria into the customer network, if needed.

For Oria in this deployment, you must use FQDNs with split-DNS. This means that the same FQDN results in different IP addresses, depending on which network the request is made from. Local hosts, e.g. MiVoice Business, and so on, must be identified only by FQDN within Oria.

A DNS server must be deployed within the same address space as Oria. The DNS resolution to the FQDN in this domain must direct to the access IP address on the 1:1 NAT/router.

There must also be a DNS server in each customer-hosted address space. The same FQDN must resolve to the application operational interface for the host within this address space.

This allows Oria to access the devices from the service provider network, and the same FQDN information can be used by the applications to communicate with each other within the hosted customer address space.

Additional management considerations

- **AMC/ULM:** Consider future expansion and whether MiCollab and UCC will ever be deployed for a particular end-customer. If UCC capabilities will never be needed, then the AMC configuration does not require use of the ULM construct. However, if the end-customer may migrate to using UCC at some time, the ULM construct within AMC should be used, even if MiCollab is not currently installed with the deployment.
- **Mitel OIG**: Configuration and deployment of the Mitel Open Integration Gateway Virtual application server requires manual management. Refer to the *Mitel Open Integration Gateway Installation and Maintenance Guide* for further details. This service is deployed on a per-customer basis within the hosted customer network.
- **Mitel Performance Analytics/Probe:**
  - Configuration and deployment of the Probe requires manual management. Probe is installed in the customer network, and must have access to the Internet for connection to a publicly-accessible server. Probe is deployed per customer, as required.
  - The Mitel Performance Analytics server is deployed inside the service provider network. The server is connected to the Public Internet so that the Probes can connect and transfer information. See Mitel OnLine for further details of the deployment requirements.
- **Isolation:** Router rules and ACLs may need to be applied to the VRF router to ensure access from the service provider space does not reach into the customer network.
- **Remote trunk gateway:** Where a remote trunk gateway is deployed, manual access and configuration is needed to bring the gateway into service and link into the hosted MiVoice

Business. The Oria management portal does not provision the remote trunk gateway, and the installer must ensure that the Oria database and the gateway databases are kept synchronized. Contact Mitel Professional Services before deploying configurations with a remote trunk gateway.

- **Internet connection:** The end-customer must have an Internet connection for license authentication and for hosted application connections, for example via Mitel Open Integration Gateway Virtual. Internet access is also needed for re-routing of mobile UC clients that normally use the external MiVoice Border Gateway, but use the customer's internal network, when located on-premise.

SMB-LD addressing considerations

The service provider IP address space is a self-contained flat network. The service provider network is totally isolated from the customer networks.

Hosted customers have their own local networks and private addressing schemes. The customer-hosted IP addresses may overlap, since the service provider VLANs are used to differentiate the different customer networks within the hosted infrastructure.

There are some restrictions on IP addresses that customers can present to the hosted space on a particular MiVoice Business Multi Instance server. The same customer IP addresses and service provider addresses cannot be used on the same MiVoice Business Multi-Instance. In practice, the service provider will use 10.0.0.0/8 addresses and customers will use 192.168.0.0/16 addresses. Details of these restrictions are described in the *MiVoice Business Multi-Instance Engineering Guidelines*.

The service provider configures a public IP address on each customer external gateway. With a large number of customers, a large number of public IP addresses must be available. The IP addresses need to be statically assigned to the gateways.

For management access into the customer hosted space, a 1:1 NAT router is needed for each customer. The router translates between a private service provider address and the private customer addresses. The router may be a physical device per customer, or may be a virtual router, as part of the virtual infrastructure.

Customer access to Oria is made though a public IP address at the edge of the service provider network. The Oria management portal authenticates access and translates connections to internal service provider addresses on the NAT routers, and eventually to hosted units in the hosted customer space.

SMB-LD end-customer, service provider, and network considerations

A careful review of all the relevant end-customer, service provider, and network considerations will support a successful deployment. The following sections are not exhaustive, and are intended to provide guidance for reviewing this architecture and ensuring that significant details have not been overlooked.

End-customer considerations

The following items should be considered for end-customers:

- Dedicated MPLS connection to hosted service provider
- Common carrier network with the service provider or carrier peering connections
- Local DHCP on customer network
- Local PSTN access can be provided with a trunking gateway.

Note: Manual management and configuration is required with a trunking gateway.

- Level of UC functionality required and connection to other applications. A different architecture may be more suitable if a customer requires more UC functionality than SMB-LD offers.
- Direct connection to non-standard interfaces (example: SIP ATA for door openers)
- Internet access is needed from the customer network for management and license verification

Network and carrier considerations

The following items should be considered for the network and carrier portions of the solution:

- MPLS is needed for connection between end-customer and hosted site
- Ability of the MPLS network provider to provide SLA and honor QoS
- Customer alarm notification to dealer or service provider. Internet service and e-mail addresses are needed for sending alarm notifications.
- Ongoing monitoring and alarm reporting requiring reseller and service provider access.
- SIP device interoperability and SIP trunk provider interoperability must be verified with the SIP-COE
- Access to applications for scheduled backups and storage including process ownership and data storage location defined
- MiVoice Border Gateway clustering and/or HA based on scaling requirements
- Service provider VLAN and use of VRF router is a requirement for customer isolation and use of overlapped IP addresses

Service provider considerations

The following items should be considered for the service provider deploying the solution:

- Provision for remote management access (example: web proxy, VPN)
- VPN connection enabled for remote management access
- NAT router and management plane access to each hosted customer network for customer management

- Template deployment for voice-centric deployment may differ from the UCC deployment (example: with and without MiCollab)
- Performance, instances per server, and traffic considerations are needed for server scaling
- Licensing model (UCC, a-la-carte, service provider, Enterprise)
- Process defined for storage and access to user information to comply with regulations for security and privacy
- Router ACLs for limited access into customer network (example: VRF)
- A defined process for collection and provisioning of billing information from SIP service provider, and communication to end-customer
- E911 call facility and emergency location information must be consistent with the PSAP's, regardless of whether calls are made over SIP trunks or local trunk breakout
- Turnover of service provider personnel and password access updates (example: password expiry, password updates)
- Backup and recovery policies
- Pre-deployment "sandbox" for pending updates
- Inclusion of Windows and VMware components and licensing
- Data center considerations including power, geo-location, cooling, security, and access
- Maintenance and provisioning staff for local and remote date centers
- Management access to local and remote data centers
- SIP trunk service provider and scaling including consolidation of trunks over many customers
- Pre-provisioning of IP addresses prior to delivery of customer end devices or use of SRC for end devices
- Overall service resiliency and redundancy risk plan considering single points of failure (example: physical environment issues, power failures, etc.)
- Embedded per instance voice mail for voice-centric deployments or MiCollab for UCC deployments
- Service provider must supply IP addresses for MiVoice Border Gateways

SMB-LD relative strengths and limitations

Each MiCloud Business Solution solution is intended to satisfy the majority of deployments with similar requirements. The capabilities of the solutions overlap. Selecting the best architecture may require comparing how the different architectures handle the different aspects of the solution. This section identifies the strengths and limitations of this architecture relative to the other MiCloud Business Solution solutions.

Table 10 identifies the strengths and limitations of this architecture relative to the other MiCloud Business Solution architectures.

Table 10: SMB-LD strengths and limitations

STRENGTHS	LIMITATIONS
• The voice and UC service provider is independent of the carrier network • MPLS allows dedicated bandwidth and Network Provider SLA and QoS • Self-contained deployment • Direct customer access as well as Over the Top Internet model for Teleworker and mobile UC softphones • Allows customer to link to existing cloud business services by extension of the MPLS circuit • Customer isolation, overlapped customer address space • Wider range of supported end-devices, SIP and Mitel proprietary • Aimed at small and medium office deployments, less than 250 users, but can be scaled • User accessible management portal, and service provider restriction of access • Simple billing • MiVoice Business/call control resiliency • Ability for service provider to deploy with a mix of customers ranging from core voice functionality through to a higher level of UC functionality.	• Mixture of virtualization technologies, MiVoice Business Multi-Instance for cost effective call control, VMware for targeted and richer UCC application support • Management access to different applications may be multi-pronged, or optional • Need NAT/Router for Oria to access MiCollab, however, Oria can provision MiVoice Business via management plane • Possible multiple templates for use of voice mail with voice-centric and UCC deployments • Manual provisioning when used with remote trunk gateway • Manual provisioning of Mitel Open Integration Gateway and Probe

Small Medium Business (SMB) and Medium Large Business (MLB) architectures

The SMB and MLB architectures share many characteristics. The SMB is based on the MiVoice Business Express platform, while the MLB architecture is based on MiVoice Business Virtual. Both run on a VMware infrastructure.

Both architectures support a number of service availability mechanisms, including MiVoice Business resiliency, MiVoice Border Gateway redundancy, and VMware High Availability (HA).

The Small Medium Business (SMB) architecture is designed to offer hosted UC services to end-customers in the small to medium-sized business market segment. The small to medium business market segment includes customers that have from 30 to 500 end-users located at one site. The SMB architecture is suitable for end-customers with UC requirements that are not business-critical. This solution uses the MiVoice Business Express platform, which combines call control, collaboration applications, and gateway functionality in a single-footprint optimized platform. The platform includes a setup wizard and system default settings to simplify installation and initial system configuration.

The Medium Large Business (MLB) architecture is designed to offer hosted UC services to end-customers in the medium to large business market segment. The medium to large business market segment includes customers with 500 to 5000 users. This architecture is also suitable for smaller customers, those with 500 or fewer users, whose business-critical communication needs justify the additional costs of a fully resilient system.

The SMB and MLB architectures are two of three MiCloud Business Solution architectures designed with a common set of components, the third being the Scalable architecture. Each of these solution architectures is capable of offering essentially the same UC capabilities. Choosing the most suitable architecture is principally based on:

- The size of the end-customer market segment that the service provider wishes to target
- The end-customer's service availability requirements

The following sections provide further information for evaluating the SMB and MLB architectures to determine whether they are suitable for meeting the customer's needs.

- “SMB sales guide” on page 61
- “MLB sales guide” on page 61
- “SMB/MLB architecture” on page 62
- “SMB/MLB considerations” on page 65
- “SMB/MLB management considerations” on page 65
- “SMB/MLB addressing considerations” on page 66
- “SMB/MLB end-customer, service provider, and network considerations” on page 67
- “SMB relative strengths and limitations” on page 68
- “MLB relative strengths and limitations” on page 69

For emergency location details, see the *MiCloud Engineering Guidelines*.

SMB sales guide

The SMB provides the same UC functionality as the MLB and Scalable architectures. Consider the MLB architecture and the Scalable architecture architectures for larger customers and customers that require high service availability.

The SMB architecture is typically used by end-customers that require an all-in-one UCC package that is easy to deploy. SMB can be used by businesses with up to 500 users. It can be used by resellers and service providers that own their own infrastructure, or rent infrastructure from another infrastructure provider.

MLB sales guide

The MLB architecture provides the same UCC functionality as the Small Medium Business architecture. The MLB architecture is optimized to support 500 to 5000 end-users, and is appropriate for customers that have a centralized head office and a number of satellite offices.

The MLB architecture offers the customer higher service availability than is offered with the SMB architecture.

The MLB architecture is typically used by end-customers or corporations that require a large hosted UCC deployment with multiple sites, and is used by resellers and service providers that own their own infrastructure, or rent infrastructure from another infrastructure provider.

SMB/MLB architecture

While SMB and MLB use different platforms, their architectures are very similar, and provisioning and monitoring use the same tools.

Oria provides user service provisioning. Probe provides fault and performance information. Billing is done through the third-party SIP trunk provider based on customer DID numbers.

For information about QoS settings for both SMB and MLB, see the *MiCloud Engineering Guidelines*.

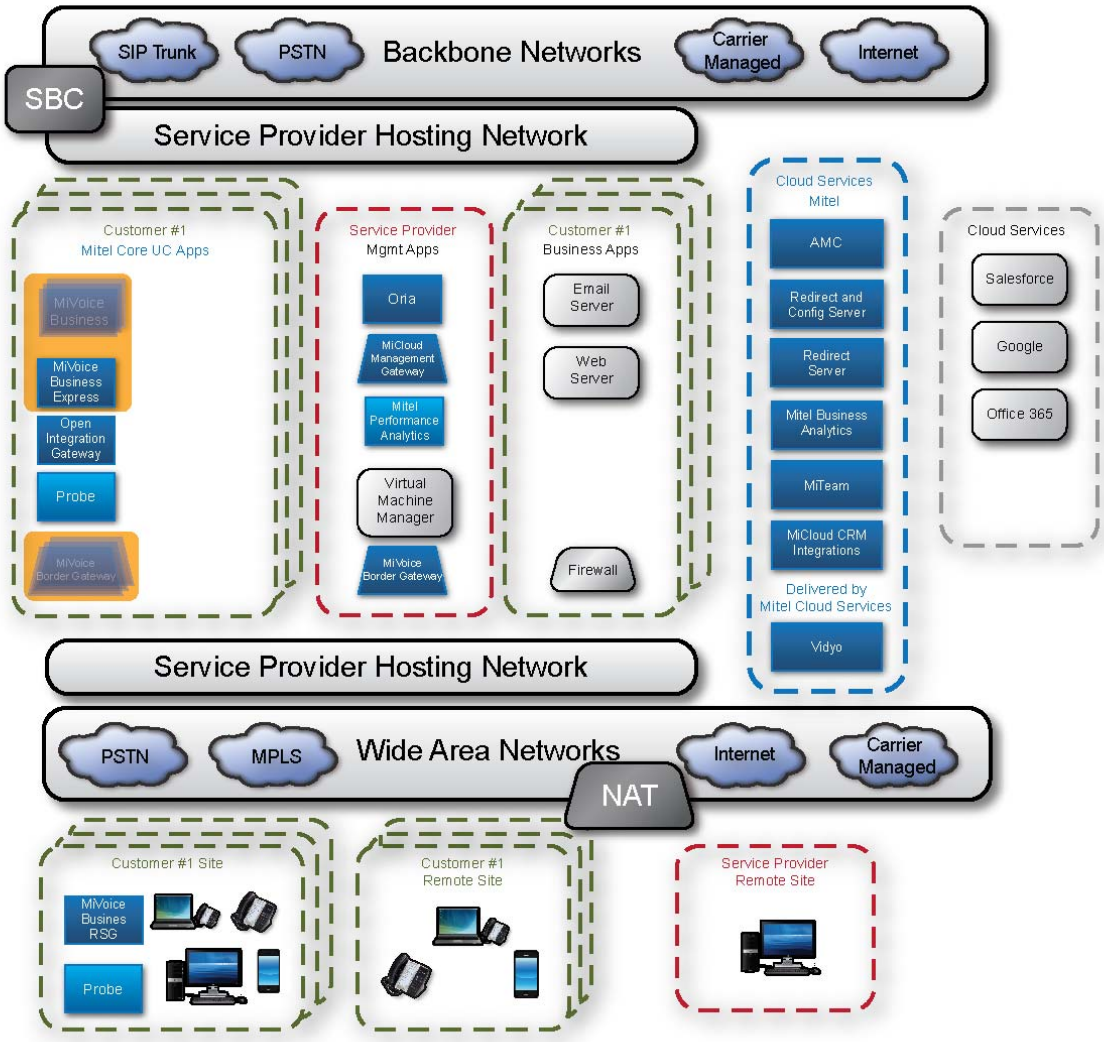
The SMB architecture is based on MiVoice Business Express. MiVoice Business Express integrates MiVoice Business, MiCollab, and MiVoice Border Gateway, and provides call control, applications and gateway functionality in a single unit. Mitel Open Integration Gateway is also available in this architecture to provide integration to related business applications.

MiVoice Business Express provides an initial configuration wizard for initial system set up. The wizard allows configuration of the basic settings such as trunk main business numbers, SIP trunk proxy, and administration e-mails. Configuration for advanced features is achieved through use of the MiVoice Business System Administration Tool.

Note: The SIP trunks and Public Network (Teleworker) are terminated on the same MiVoice Border Gateway public IP address.

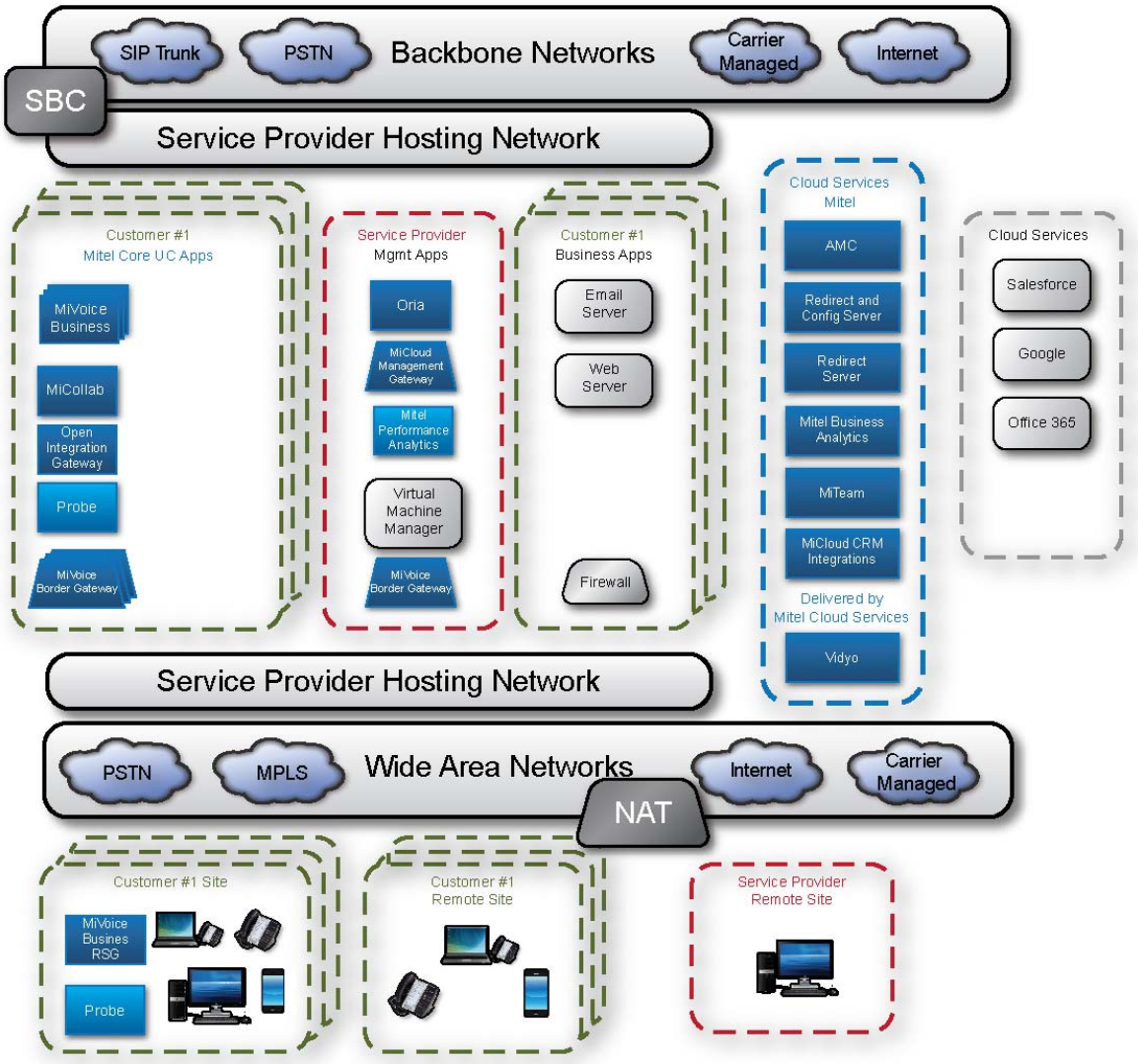
SMB supports connections over MPLS and/or public network connections. In the public network case, SMB does not support LAN phones. While using connections over the public network is less expensive, Quality of Service (QoS) cannot be guaranteed.

Figure 10: Small Medium Business architecture



The MLB architecture is built on the Mitel virtual appliance portfolio comprised of MiVoice Business Virtual, MiCollab Virtual, MiVoice Border Gateway Virtual, MiCloud Management Gateway, and Oria user service provisioning.

Figure 11: MLB architecture



The MLB architecture provides similar service and management capabilities as private hosted applications do, with the addition of Service Provider management applications.

For typical deployments including contact center agents, MiVoice Business instances are deployed as a resilient pair. For larger sites, multiple MiVoice Business instances may be used. For further scaling, the MiVoice Business network may be segmented into tiers, with dedicated trunking gateways and user controllers. See the *MiVoice Business Engineering Guidelines* for more information.

With the optional Contact Center applications described later in this guide, and for large numbers of agents, the MiVoice Business network may be further segmented into trunking

gateways, path/queue controllers, and agent controllers. See the *Contact Center Blueprint* for details.

The MiVoice Border Gateway supports Teleworker, SIP Trunk, and web proxy services. As shown in Figure 11, multiple instances of the MiVoice Border Gateway may be required to support specific network configurations or to support the required capacity.

SMB/MLB considerations

The following sections highlight some considerations that apply to the Small Medium Business and Medium Large Business architectures.

Supported phone and end-user device types

The SMB and MLB architectures support the use of MiVoice 53xx IP Phones, the MiVoice Business Console, specialty end-points, MiVoice Video and Conference phones, MiCollab softphones, and mobile clients, SIP Analog Terminal Adapters, alarm interfaces, and door openers. For a complete list of supported end-points, refer to “Users and devices” on page 113.

Quality of Service considerations

Quality of Service (QoS) must be provided throughout the customer premise LAN and the service provider Hosting LAN, across the MPLS network connecting the customer premise to the hosting network, and across the connection to the SIP trunk service provider.

Service Level Agreements should be established with the SIP trunk service provider to ensure that priority marked packets are treated appropriately.

The Teleworker connections are made over the public Internet and SLAs and QoS are not typically honored due to uncertainty of the connection route over different networks. In the absence of SLAs, it is recommended that the customer provide a means of enabling QoS and queuing mechanisms in their own network and in the Teleworker local network. Traffic shaping units can also be included in the customer connection, either by the Public Network Provider, or installed on the customer site. These effectively throttle unmarked download traffic to provide sufficient bandwidth for voice traffic.

For further information about QoS settings. see the *MiCloud Engineering Guidelines*.

SMB/MLB management considerations

Management of the SMB and MLB architectures is performed by the service provider from the service provider's site using both native management interfaces and the Oria Service Provider Portal. Customers can manage their own sites using the Oria Customer Administration Portal.

For details about the native management interfaces refer to the appropriate product documentation. For details about Oria, see “Management considerations” on page 125 and the Oria product documentation.

For SMB

A DNS server must be deployed in the same address space as Oria. The DNS resolution to the FQDN, in this domain, must point to the access IP address on the 1:1 NAT/router. Oria is programmed with IP addresses of the MiVoice Business, and so on.

There must also be a DNS server in each customer-hosted address space. In this address space, the same FQDN must resolve to the application operational interface for the host.

This allows Oria to access the devices from the service provider network, and the same FQDN information can be used by the applications to communicate with each other inside the hosted customer address space.

In cases where there is a requirement to monitor the service provider's network from a remote location, Mitel Performance Analytics and Probe can be used to monitor equipment alarms and voice quality of phone calls.

For MLB

To use Oria in the MLB deployment, FQDNs with split DNS is required. This means that the same FQDN results in different IP addresses, depending upon which IP address space the request is made from. Local hosts, e.g. MiVoice Business, and so on, must be identified only by FQDN within Oria.

A DNS server must be deployed within the same address space as Oria. The DNS resolution to the FQDN, in this domain, must point to the access IP address on the 1:1 NAT/router.

There must also be a DNS server in each customer-hosted address space. The same FQDN must resolve to the application operational interface for the host within this address space.

This allows Oria to access the devices from the service provider network, and the same FQDN information can be used by the applications to communicate with each other inside the hosted customer address space.

In cases where there is a requirement to monitor the service provider's network from a remote location, Mitel Performance Analytics and Probe can be used to monitor equipment alarms and voice quality of phone calls.

SMB/MLB addressing considerations

The customer's local network and the service provider network that hosts applications for the customer use a private IP addressing scheme. The SIP trunk provider and the Internet service provider use the same public IP addresses to reach the MiVoice Border Gateways. The MiVoice Border Gateways must use statically assigned IP addresses. Teleworker users connect to the Teleworker gateway using their own public IP address provided by the carrier, or a statically assigned IP address at the customer router.

The service provider router also provides the network address translation from internal LAN address to external public address. MiVoice Border Gateway translates customer public IP addresses to appropriate internal IP addresses.

SMB/MLB end-customer, service provider, and network considerations

The following sections are not exhaustive, and are intended to provide guidance for reviewing this architecture and ensuring that significant details have not been overlooked.

End-customer considerations

- Customer edge router for connection to the MPLS network
- Firewall/NAT proxy for connection to external networks
- QoS-enabled LAN networking to provide high quality voice service

Note: E911 services are expected to be provided by the SIP Trunk provider based on end-user DID numbers.

Typically, the end-customer is responsible for maintaining and updating the E911 location information. This is particularly important for Teleworker users who are not located in the customer's office locations.

Network considerations

MiCloud Business is designed with the customer's address space extended into the hosted environment. Customer network isolation is achieved using VLANs and typical network isolation techniques, for example: firewalls and routing rules. Overlapped customer address spaces are allowed within these isolated networks.

Networks carrying voice must support QoS mechanisms to provide high quality voice services. Use of QoS mechanisms allow networking equipment to:

- Perform traffic shaping based on layer 2 QoS tagging and/or layer 3 priority
- Segregate voice and data network traffic into separate queues

To ensure good voice quality, it is recommended to over-provision bandwidth capacity on LAN and WAN connections. Mitel Performance Analytics may be used to troubleshoot voice quality issues.

Hosted components require network connectivity to:

- Third-party SIP trunk providers

  Connection to the SIP trunk providers is made through multiple MiVoice Border Gateways, which should be configured with 1:1 redundancy. MiVoice Border Gateway provides Session Border Controller (SBC) functionality to manage interoperability with third-party SBCs.

  The MiVoice Border Gateways should be deployed as a cluster to allow sharing of SIP trunk licenses. Load balancing of outgoing connections is based on MiVoice Business Automatic Route Selection (ARS) tables. Load balancing of incoming connections depend on the capabilities of the third-party SBC. Overall load balancing should be arranged to share the load across the MiVoice Border Gateway's in the cluster. Connection to multiple third-party SIP trunk providers is supported. Multiple providers may be used to improve reliability or to allow selection of alternative long distance providers.

- Customer on-premise networks

  The SMB and MLB architectures use a dedicated MPLS connection to the end-customer sites. This MPLS connection allows virtual routing and forwarding (VRF) such that customer end-points securely access the MiVoice Business and MiCollab deployed on the LAN. End-points are connected to the LAN side of the server gateway. It is possible to deploy MiCloud Business Solution architectures with public network connectivity to customer sites. The main concern is the ability to satisfy QoS considerations. For further guidance on possible deployment with public networks, contact Mitel Professional Services.

- Remote client access

  Remote clients access call control and applications over the Internet with connectivity through the MiVoice Border Gateway, providing Teleworker service. The MiVoice Border Gateways should be clustered to provide license sharing, MiNet end-point load balancing, and resiliency.

  MiCollab Clients do not support redirection by the MiVoice Border Gateway, so these clients cannot be load-balanced. MiCollab Client resiliency is achieved using the VMware High Availability feature.

- External cloud services

  Integration to cloud services is done through the Mitel Open Integration Gateway. The service provider should ensure sufficient bandwidth is available to support the expected end-customer transaction traffic.

Service Provider considerations

- Application Management Center – Mitel components require web service access to the license server for operational verification.
- Probe – web-based service for fault and performance monitoring
- E-mail forwarder for alarms and notifications
- Public DNS registrations for MiVoice Border Gateway gateways

SMB relative strengths and limitations

Table 11 identifies the strengths and limitations of this architecture relative to the other MiCloud Business Solution architectures.

Table 11: SMB strengths and limitations

STRENGTHS	LIMITATIONS
• Optimized for 50 to 250 end-users, with the ability to scale to 500 end-users • Scalability to address end-customer target sizes • Full feature-rich UC capabilities • Integrated solution offering simplified deployment and management • Platform includes a setup wizard and system default settings to minimize initial system configuration.	• Limited scalability, scales to 500 end-users maximum • Limited deployment options; only server-gateway deployment is supported

Table 11: SMB strengths and limitations

STRENGTHS	LIMITATIONS
• Voice Quality-of-Service (QoS) is provided for devices that are connected via the MPLS network. • Capability for hosted UC services alongside other hosted business applications on a shared VMware vCloud platform • vCloud capabilities to maximize availability and support business continuity configurations • Shared hardware and hardware support services for cost savings • User licenses optimized for office, knowledge, and mobile workers. • Hundreds of call control features available as standard • Dynamic status to improve communication productivity • Audio, video and web conferencing to enable teamwork from anywhere • Support for a wide range of devices available from Mitel, plus qualified third-party SIP devices • Predictable service levels and operational expenditure • Reduced need for specialist resources in-house • Customer site local survivability and PSTN break out is supported through the use of a 3300 ICP running MiVoice Business at the customer site	

MLB relative strengths and limitations

Table 12 identifies the strengths and limitations of this architecture relative to the other MiCloud Business Solution architectures.

Table 12: MLB strengths and limitations

STRENGTHS	LIMITATIONS
• Optimized for 500 to 5000 end-users • Supports MiVoice Business resiliency and redundant MiVoice Border Gateway configuration • Supports single-tier and two-tier MiVoice Business architectures for improved capacity and resiliency • Supports deployment with MiVoice Border Gateway in server gateway or DMZ configuration • Voice quality of service (QoS) is supported for devices that are connected via the MPLS network	• Limited scalability, scales to 5000 end-users maximum • May not be cost effective for smaller deployments

Scalable architecture

The Scalable architecture may be adapted to support 10,000+ end-users. The scaling is achieved with building blocks based on the MLB architecture. This is augmented with enterprise-wide services deployed using standalone virtual applications such as MiCollab Unified Messaging. The architecture supports business-critical unified communications requirements with multiple resilient MiVoice Business platforms and redundant MiVoice Border Gateway configurations.

The Scalable architecture is intended for a single customer, although the customer may have a number of offices that are geographically distributed. An example would be an enterprise with corporate headquarters and a number of regional offices.

This shared services architecture provides the customer with the flexibility to define partitions around business units or geographic sites. allowing the UC functionality to be tailored on a per-partition basis. The solution is attractive for enterprises operating with a diversified IT infrastructure. Hosting the services in one or more data centers and linking the sites with a common network simplifies the deployment and reduces costs, compared to a multi-site on-premise solution.

The Scalable architecture is a large and complex deployment. It is managed, in part, by enterprise IT staff, and they may require training to understand how to deploy and manage it. Management is performed from inside the customer address space, with external access provided for support by the service provider and/or reseller.

This deployment is based on a building block of up to 5000 UC users. It requires the identification of business units within the Enterprise that are limited to 5000 users. Multiple business units are then linked together to scale to larger deployment sizes. The linkage requires application and federation connections between the UC components across all the business units, plus the addition of common functionality, such as centralized Auto-Attendant.

Each deployment requires custom design to meet customer needs, and although an initial template is provided, the end requirements may change that design. Other configurations or solutions may be included for these larger deployments, especially to link to existing business processes and equipment; e-mail and messaging services, for example.

Contact Professional Services when considering a deployment of this size and complexity. This will ensure that the deployment meets the customer requirements, links successfully to existing business equipment, and ensures a timely roll-out of the deployment.

Scalable architecture business and sales guide

The Scalable architecture is used by service providers wishing to address:

- Enterprises that require customized services for individual business units or operating with a diversified IT infrastructure, such as those present following corporate acquisitions and mergers
- Large corporations that want to outsource a large part of the data center infrastructure, and maintenance and operational costs

- Large corporations that have a number of large regional offices all linked through a common data network.

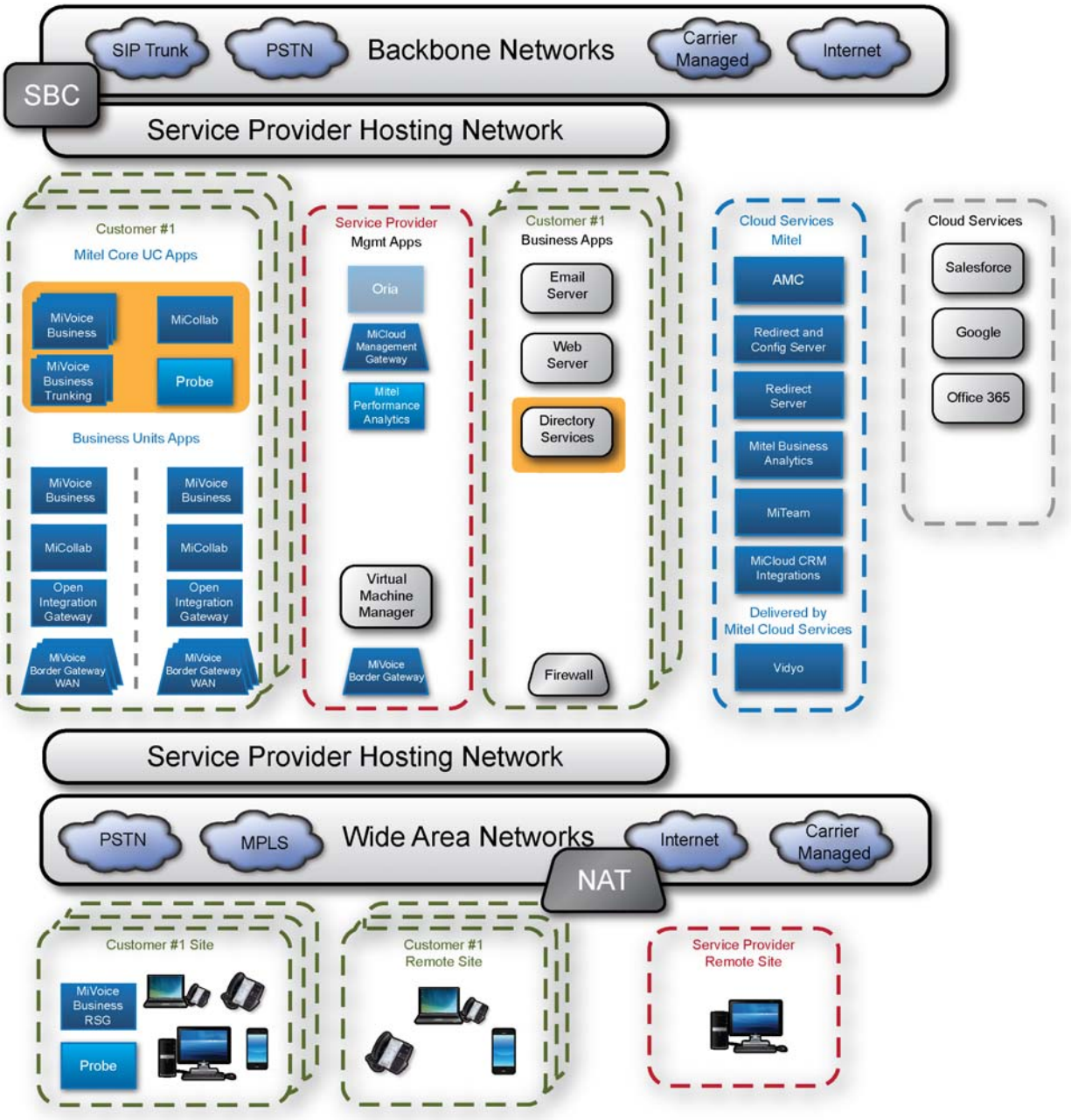
Typical end-customer:

- Large corporation or Enterprise
- IT and application knowledgeable staff

Scalable architecture description

Figure 12 is provided as an example template for the MiCloud Business Solution Scalable architecture.

Figure 12: Scalable topology



In this architecture, multiple MLB building blocks are deployed to provide services to different business units. The configuration of the MLB building block is similar to that described earlier. Enterprise-wide additions include:

- MiVoice Business configured as trunking controller to provide trunk consolidation
- MiVoice Border Gateway clusters provide the session border controller functionality (SIP proxy) for connection to third-party service providers

- MiCollab-Unified Messaging is added to provide enterprise-wide auto attendant

Management includes MiVoice Business embedded tools and Mitel Performance Analytics, similar to the Virtual (MLB) architecture. User Service provisioning is achieved through integration to third-party Directory Services, such as Microsoft Active Directory. With this integration, enterprise-wide services versus business unit services are based on the directory node used for integration.

Note: Oria does not support Directory Services integration and is not included in the architecture.

Chapter 3

MICLOUD ENHANCED SERVICES

ARCHITECTURE OVERLAYS

MiCloud Enhanced Services architecture overlays

MiCloud Business planning and deployment include the concept of “Enhanced Services” overlays that can be used with the reference architectures described in this guide.

The four overlay reference architectures are supported for both single-tenant and multi-tenant architectures. Differences between the service capabilities supported in these architectures are detailed in subsequent sections.

There are four new architecture overlays:

- “MiContact Center Business overlay” on page 77

  Enhances the reference architectures with applications to meet the requirements of Contact Centers. This overlay includes MiContact Center Business and MiVoice Call Recording.

- “MiCloud Business Analytics overlay” on page 84

  Enhances the reference architectures with a business productivity application that enables monitoring call activity and generates call metrics.

- “Vidyo® Enhanced Services overlay” on page 86

  Enhances the reference architectures with an immersive video collaboration solution.

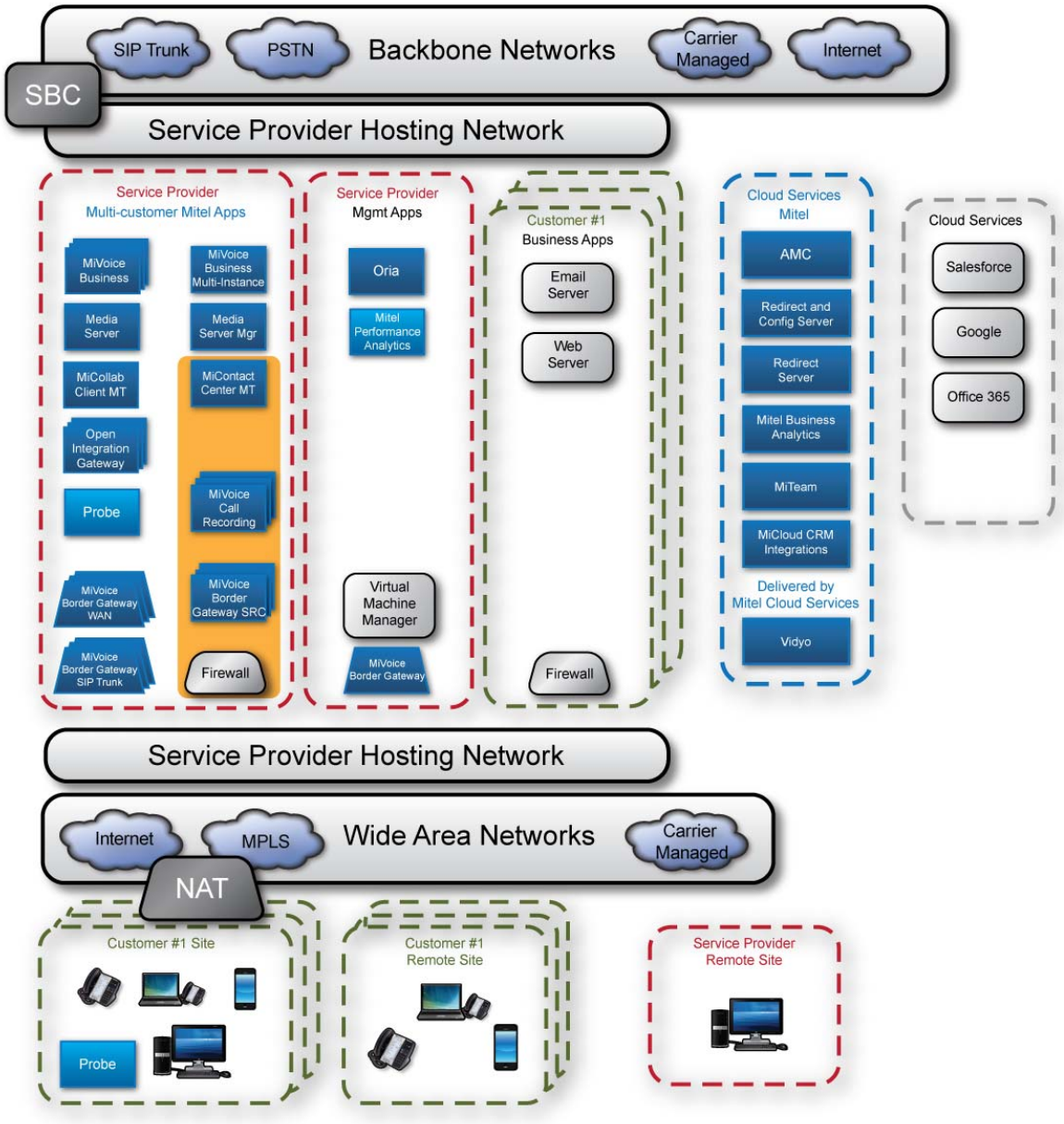
- “MiVoice for Skype for Business overlay” on page 87

  Enhances the reference architectures to support customers deploying Skype for Business collaboration with the Mitel communication solution.

MiContact Center Business overlay

Contact center capabilities are supported as an overlay for all of the reference architectures. The figures below show the overlay on the multi-tenant and single-tenant reference architectures, SB and MLB. These are easily extended to the other architectures described in the previous chapter.

Figure 13: Contact Center overlay - SB architecture

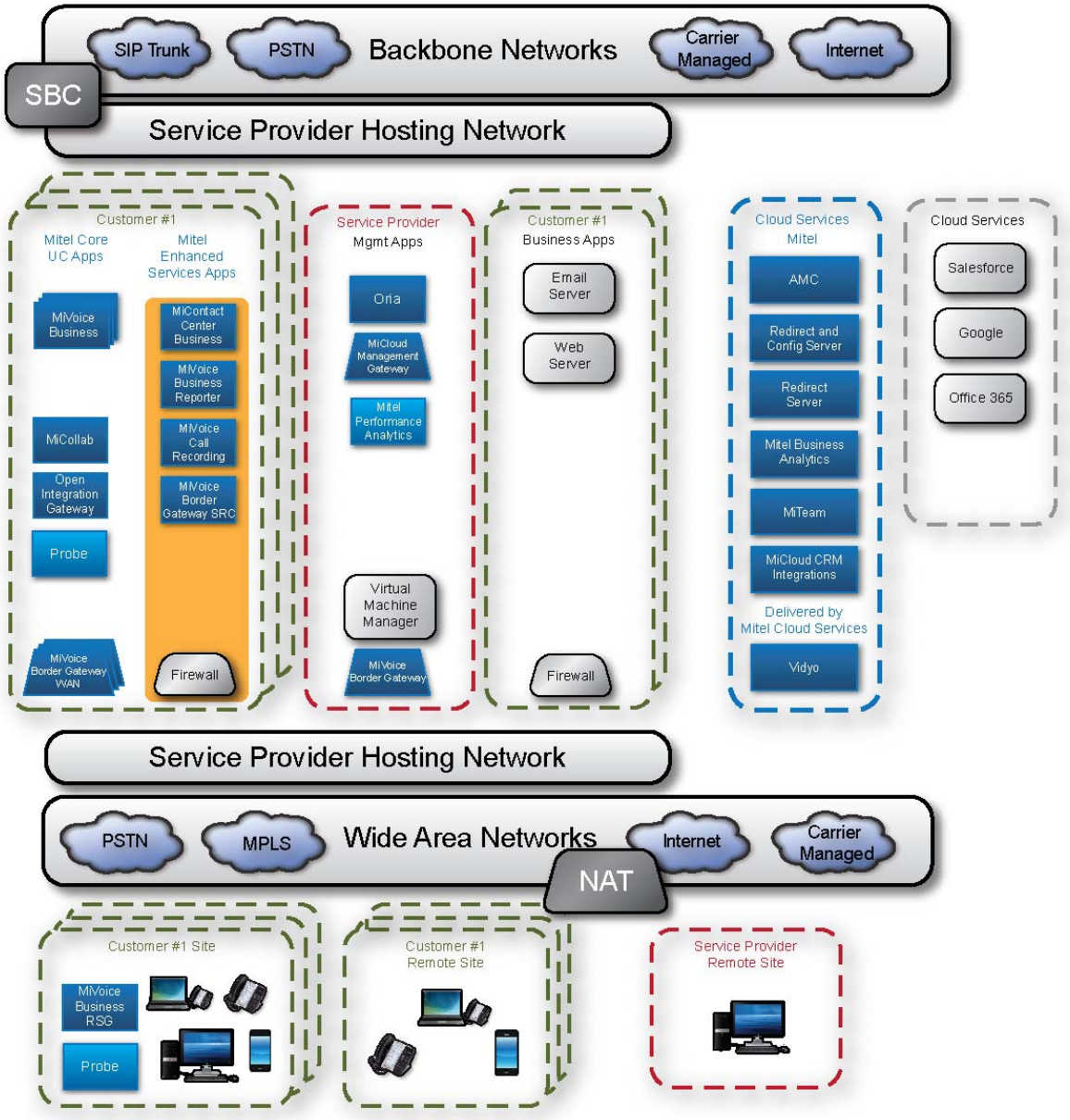


The multi-tenant SB architecture adds these contact center applications:

- MiContact Center Business Multi-tenant
- MiVoice Business Reporter
- MiVoice Call Recording
- One or more MiVoice Border Gateway Secure Recording Connectors (SRC)

MiVoice Call Recording desktop clients connect to the MiVoice Call Recording server through a third-party firewall.

Figure 14: Contact Center overlay - MLB architecture



The single-tenant MLB architecture adds the contact center applications:

- MiContact Center Business
- MiVoice Business Reporter
- MiVoice Call Recording
- MiVoice Border Gateway Secure Recording Connector (SRC)

MiVoice Call Recording desktop clients connect to the MiVoice Call Recording server through a third-party firewall.

Differences between the contact center capabilities for the multi-tenant and single-tenant solutions are based on the differences in the capabilities of MiContact Center Multi-tenant and MiContact Center Business single-tenant application. Table 13 compares the service capabilities for the two modes of operation.

Table 13: Multi-tenant versus Single-tenant MiContact Center: Capabilities

CAPABILITY	MULTI-TENANT	SINGLE-TENANT	COMMENTS MULTI-TENANT MODE
END-CUSTOMER SERVICES			
MiContact Center core functionality (ACD, IVR)	Y	Y	* See Notes
Agent soft phones	Y	Y	Optional MiCollab soft phone * See Notes
Multimedia (Ignite client)	N	Y	WAN bandwidth limitation when using multiple tenants
Supervisor Client (CCC) with soft phones	Y	Y	
Reporting	Partial	Y	Traffic Analysis (trunk), Conversation, and Administrative reports are not available per-tenant, but only for the entire Service Provider.
Salesforce.com integration	Y	Y	Using MiVoice Integration for Salesforce (via Mitel Open Integration Gateway)
Account codes, Make Busy codes	Y	Y	Codes must be unique across all tenants. The service provider may choose to allocate ranges per tenant.
Business application integration	Y	Y	Integration for IVR routing is supported. Ignite with screen pops for agents is not supported.
MiVoice Business Reporter	partial	Y	Call Accounting is supported in Multi-tenant mode, but Call costing is supported only at the Service Provider level. Security Access Control List options and configuration are removed from the UI in the Multi-tenant mode, but the Security ACL is available for multiple tenants with deployment of MiVoice Business Reporter in single-tenant mode.
Flexible Reporting	N	Y	Flexible applications and reports are not tenanted, so they are available only at the Service Provider level for all of the Customers.

Table 13: Multi-tenant versus Single-tenant MiContact Center: Capabilities

CAPABILITY	MULTI-TENANT	SINGLE-TENANT	COMMENTS MULTI-TENANT MODE
SQL Views	N	Y	SQL Views are not tenanted., so they are available only at the Service Provider level.
WorkForce Scheduling	N	Y	Workforce Scheduling is not tenanted, so it is available only at the Service Provider level.
Alarm management per customer	N	Y	Alarms Management is not tenanted., so it is available only at the Service Provider level.
SERVICE PROVIDER MANAGEMENT			
Service Provider management	Y	Per-instance	For single-tenant, the Service Provider must log in to each server individually. With the same software versions, a single instance of YourSite Explorer supports remote login to multiple instances of MiContact Center, either single instance or multi-tenant.
Tenant configuration (Security defaults)	Y	N/A	
Customer self-management	Y	Y	
License usage per customer	Y	Y	License usage is automatically uploaded to Mitel CRM for billing and reporting. This report is not directly accessible by the Service Provider.
Multiple software versions	N	Y	
Upgrade scheduling per customer	N	Y	
Tenant migration	N	Y	* See Notes
Data segregation Data sovereignty	N	Y	* See Notes

Notes: Caveats and recommended guidelines for MiContact Center Multi-tenant; for details, see the *MiCloud Engineering Guidelines*:

1. Multi-tenant customer configuration data is updated on every MiContact Center client (Ignite and CCC). With multi-tenant deployment, these updates are more frequent and the update size is larger. Also, it is difficult to control the time of day of updates. For small sites, the bandwidth required for updates may affect the QoS for active agent streams.

   To mitigate the bandwidth consumption, CC clients are supported for supervisors only.

For sites with minimal bandwidth available, it is recommended to set Max IP packet size to limit QoS effects, and to use a premise-based router with TCP back-pressure to limit bandwidth.

2. MiContact Center Business does not support multiple time zones. MiContact Center Business uses the time of its server. For reports—agent log-in, for example—times are reported in the time zone of the server. The IVR must be programmed to reflect the time zone of the server, which is further complicated with non-standard daylight savings time zones.

   It is recommended that you deploy one MiContact Center Multi-tenant per time zone.

3. MiContact Center Multi-tenant uses a common database and data storage for all configuration and reporting data for all tenants. There is no ability to limit cross-tenant exposure in the event of a data breach, and there is no ability to move data to premise-based storage, or to meet sovereignty requirements.

   Service providers must ensure the database security meets the highest requirements of any tenant.

4. User names must be unique within the application. The application enforces the e-mail address format, but not the e-mail address content. Make Busy, DND, and Account Codes must be unique across all tenants.

   Service providers should establish processes to ensure unique user names and codes.

5. For multi-tenant applications, maintenance and upgrades affect all tenants.

   For 24 x 7 data centers, service providers should segregate to a dedicated MiContact Center Multi-tenant and/or deploy a single-tenant MiContact Center Business to facilitate scheduled maintenance windows.

MiVoice Business Reporter constraints

MiVoice Business Reporter provides capabilities for call accounting and call costing. Call accounting is tenanted, but call costing is not.

For service providers offering call costing, MiVoice Business Reporter continues to support multiple customers through access control lists, as was available in earlier releases.

- Releases before MiVoice Business Reporter 8.0: Use access control lists to separate one tenant's data from that of another tenant.
- MiVoice Business Reporter: Uses site-based identifiers.

The configuration of the access control lists required for MiVoice Business Reporter to support multiple customers is not available when the application instance is operating in multi-tenant mode, so these two modes of operation are not supported concurrently in a single instance of the software.

To provide both MiContact Center Multi-tenant and MiVoice Business Reporter with call costing, separate instances of MiContact Center Business are required—MiContact Center Multi-tenant set for multi-tenant mode and MiVoice Business Reporter set for single-tenant (default) mode. For the multi-tenant solutions, the service provider must extract tenant information from the MiVoice Business Reporter data. This is typically accomplished based on trunk routing numbers.

Contact Center component constraints

The component constraints for the contact center applications include:

- Oria provisioning support is not available directly for MiContact Center Business. The provisioning flow is as follows:

  a. In Oria, provision agents and agent phones.

  b. Agent provisioning flows through the agent provisioning to MiVoice Business and MiCollab. MiContact Center Business supports synchronization with MiVoice Business, automatically through nightly syncs, and manually on demand.

  c. Log in to the MiVoice Business to configure advanced path scenarios and other MiVoice Business-specific capabilities.

  d. On MiContact Center Business, configure RADs, Music on Hold, and other MiContact Center Business capabilities.

  Details are provided in the MiCloud Deployment Guides.

- Oria provisioning support is not available for MiVoice Business Reporter or MiVoice Call Recording. Provisioning must be done using the local provisioning interfaces of these applications.

  It is recommended that Service providers define operational processes to ensure the continuing alignment of the provisioning databases for Oria and the embedded application databases.

MiContact Center Multi-tenant constraints

MiContact Center Business integration to MiVoice Call Recording does not support tenanting. The integrated call recorder client with CC Client Supervisor client is not supported—both CC Client and MiVoice Call Recording desktop client must be installed.

MiVoice Call Recording

- The Speech Search option is not supported in MiCloud licensing.
- Screen recording is not supported for cloud deployments; bandwidth requirements for screen recording are not economical.
- SIP recording, line-side or trunk-side, is not supported for cloud deployments.
- EHDU trunk recording is not supported. For cloud deployments, EHDU trunks are SIP trunks, for which recording is not supported.
- MiNet line-side recording ports are statically configured. SIP line-side recording supports dynamic assignment, but SIP recording is not supported in cloud deployments.
- MiVoice Border Gateway does not support MiVoice Call Recording desktop clients. A third-party firewall is required for desktop client access to the MiVoice Call Recording server. The MiVoice Border Gateway now supports web proxy for the web clients.

See the *MiCloud Engineering Guidelines* and the engineering guidelines for the component products to ensure that any application-level requirements and constraints are satisfied for a specific customer deployment.

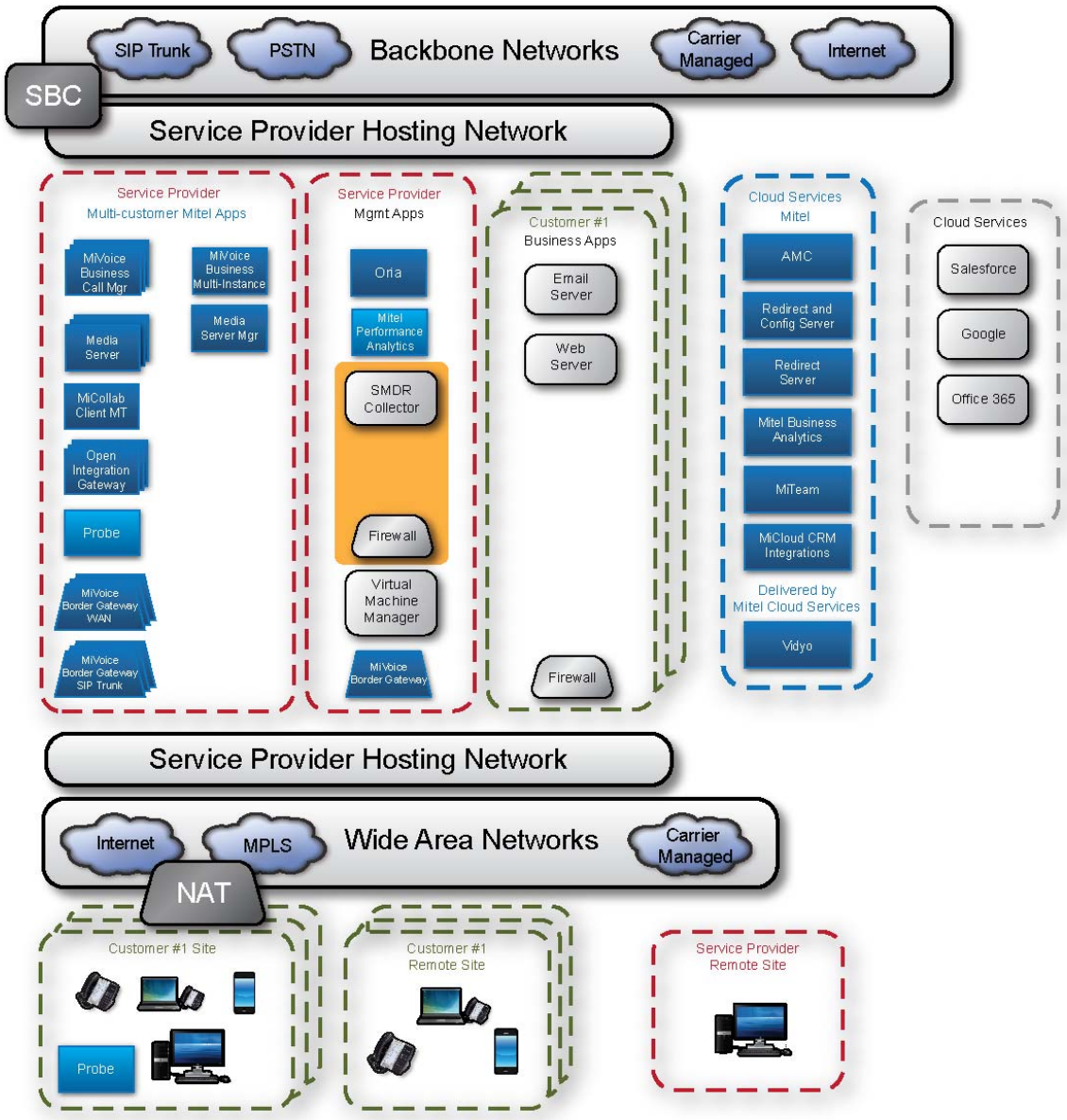
MiCloud Business Analytics overlay

MiCloud Business Analytics is a cloud-based service with user access via a standard web browser. MiCloud Business Analytics is supported as an overlay on all the reference architectures. The only additional component required is the Delivery Controller. This is a Windows server deployed in the service provider management network and acting as a local SMDR collector node.

The figures below show the overlay on the multi-tenant and single-tenant reference architectures, SB and MLB. The extension to other platform variations is straightforward.

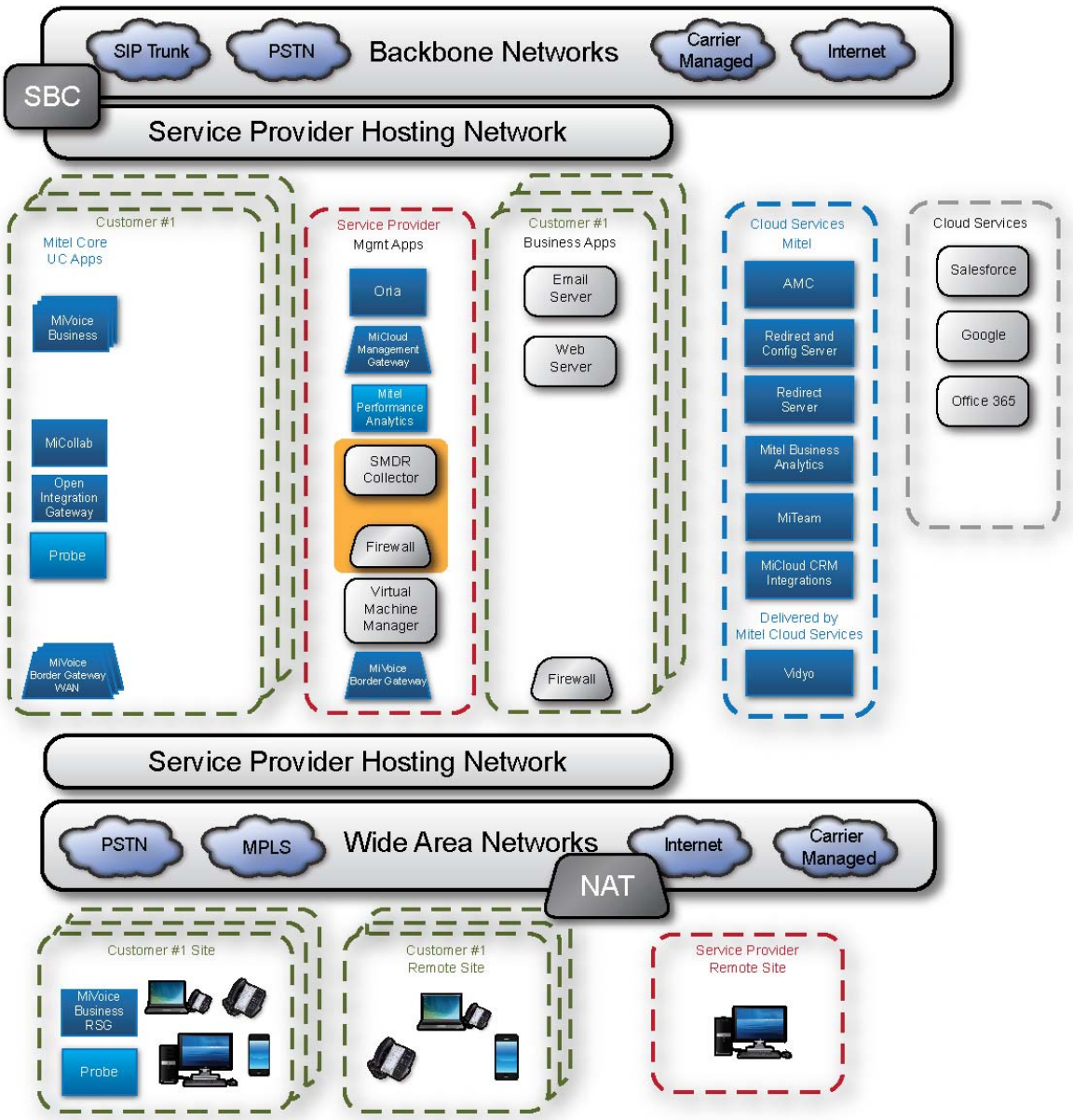
For the multi-tenant architecture (Figure 5), MiCloud Business Analytics requires the addition of the Delivery Controller, an SMDR collector node in the service provider management network, with access to the MiVoice Business instances in the shared customer applications network. The SMDR Collector node provides a secure connection to the cloud hosted MiCloud Business Analytics servers through a third-party firewall.

Figure 5: SB Multi-tenant architecture with MiCloud Business Analytics



For the single-tenant architecture (Figure 6), MiCloud Business Analytics requires the addition of the Delivery Controller, an SMDR collector node in the service provider management network. The MiCloud Management Gateway is used to provide connectivity with the MiVoice Business instances in the isolated customer applications networks. The SMDR Collector node provides a secure connection to the cloud hosted MiCloud Business Analytics servers through a third-party firewall.

Figure 6: Single-tenant architecture with MiCloud Business Analytics



Vidyo® Enhanced Services overlay

Vidyo is a cloud-based service providing an immersive video service. Service Providers purchase hosted Vidyo from Mitel Cloud Services. There are no changes to the reference architectures to support Vidyo, other than the addition of the Vidyo desktop client for users.

For single-tenant solutions with MiCollab, MiCollab provides provisioning integration and an integrated user experience, with launch from the MiCollab desktop client. To support Vidyo

services requires the deployment of the MiCollab Vidyo integration blade; MiCollab Client desktop client handles the installation of the Vidyo desktop client.

Vidyo integration requires MiCollab in integrated mode. This is not supported for multi-tenant solutions, which include MiCollab Client Multi-tenant in co-located mode. For multi-tenant solutions, Vidyo services are configured and provisioned using the Vidyo Portal; desktop clients must be downloaded and installed using the Vidyo Portal.

MiVoice for Skype for Business overlay

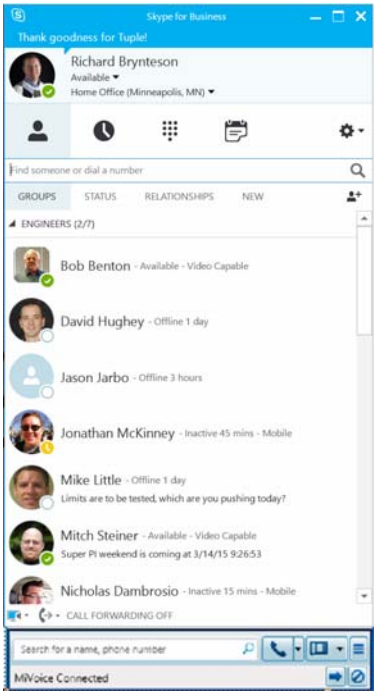
MiCollab Client supports MiVoice for Skype for Business clients, enabling integration to the Microsoft Skype for Business collaboration application. With this integration, all call processing is handled by the MiVoice Business instance. Skype for Business (previously called Lync) is used for corporate directory and instant messaging, and to provide presence information to other Skype for Business users in the deployment. All other MiCloud applications are supported in the deployment, including MiCollab, MiContact Center Business, and MiVoice Border Gateway.

The MiVoice for Skype for Business client integrates with the Skype for Business client to enable users to make calls using the Mitel voice solution, and supports typical phone control functionality, such as accessing voice mail, setting Do Not Disturb and using speed dialing.

This is a client-side integration. The MiVoice for Skype for Business interfaces with the MiCollab Client in a way similar to that used for other MiCollab soft phones, and interfaces with the Skype for Business client to update presence information. The Skype for Business client sends updates to the Skype for Business server. There is no integration or connection between the MiCollab server and the Skype for Business server.

MiVoice for Skype for Business is supported for both multi-tenant and single-tenant architectures. The new component, MiVoice for Skype for Business, is a client application. The integrated client is shown in Figure 7.

Figure 7: MiVoice Integration for Skype for Business



MiVoice for Skype for Business component constraints

For the MiVoice for Skype for Business overlay architecture, component constraints include:

- Microsoft Skype for Business uses Microsoft® Active Directory® for provisioning. Oria does not support Active Directory directly. Users must be separately provisioned in Oria; bulk import of Active Directory users is recommended.
  - In the scenario for which Active Directory integration is used (possible, but not recommended), both Skype for Business and MiCollab can use the common Active Directory for provisioning.
- MiCollab Multi-tenant requires a unique user ID across the platform. User IDs are typically based on a variant of the e-mail address to ensure uniqueness; “firstname.lastname.mitel.com”, for example. MiCollab Client does not support the “@” character, such as for “x.y@abc.com”.

  For Skype for Business Online, the full e-mail address is typically used for user identification with the “@” character. For premise-based Skype for Business deployments, the Active Directory user names may not be unique across tenants. The MiCollab Multi-tenant user ID is unlikely to match the Skype for Business User ID and the alternate name must be configured in the MiVoice for Skype for Business client.

Chapter 4

APPLICATIONS

Applications

The Mitel UC solution provides a rich feature set encompassing core voice capabilities with an extensive telephony feature set, and a customizable UCC feature set including mobility capabilities.

The solution architectures rely on several common product portfolio elements to deliver this functionality. These application platforms are described in the following sections:

Application entitlement is built into the UCC User licenses. The capabilities for each level of user license, Basic IPT, Standard IPT, Entry UCC, Standard UCC, and Premium UCC are described for Enterprises in *MiCollab General Information Guide*, and for service providers in *MiCloud Business Solution for Service Providers Licensing Guide*.

All the architectures described in this blueprint support rich UCC capabilities, with the exception of the Small Business architecture designed to provide cost effective light UC services. The Small Business architecture includes capabilities supported by MiVoice Business, including embedded voice mail, and MiCollab Client.

The Emergency Response Adviser is suitable for enterprise on-premise or cloud deployments. It is not supported for service provider deployments.

MiVoice Business

MiVoice Business includes an extensive number of applications and system features that support effective and efficient communications. These applications enhance communication, productivity, accessibility, and mobility, and support the specialized site requirements of businesses and institutions, such as: hotels, hospitals, schools, military sites, and contact centers.

Call control

The MiVoice Business call control engine provides sophisticated call management, applications, and desktop solutions to businesses.

MiVoice Business is a time proven, highly scalable, resilient, and robust call control engine that uses the power of IP while fully supporting traditional TDM-based telephony for legacy devices and PSTN connectivity.

The MiVoice Business architecture uses the IP network to connect IP telephony devices together. If support for TDM telephony is not required, MiVoice Business may be installed on an Industry Standard Server running Mitel Standard Linux, VMware, or Mitel's virtualization platform (MiVoice Business Multi Instance).

If support for TDM telephony is required, MiVoice Business may be deployed on one of Mitel's 3300 ICP platforms which provide a supplementary TDM subsystem to switch calls between traditional TDM telephone devices.

Embedded voice mail

MiVoice Business includes an integrated fully-featured voice mail system. The number of ports available to support simultaneous voice mail calls and the maximum number of mailboxes supported depends on the platform. For voice mail capacity limits, refer to *MiVoice Business Engineering Guidelines* available on Mitel OnLine.

Fax

If support for FAX is required, a 3300 ICP can be deployed as a FAX gateway. The 3300 ICP can be configured to allow faxes to be sent over IP trunks between FAX machines that are connected to 3300 ICP systems. A 3300 ICP running MiVoice Business supports the real-time transmission of FAX using G.711 pass-through or the T.38 Group 3 FAX protocol. For hosted deployments without 3300 ICP platforms, web fax available from cloud service providers is recommended.

For further information, see the MiVoice Business product documentation available on Mitel OnLine.

Platforms

MiVoice Business call control software is available for deployment on 3300 IP Communications Platforms (ICP), Industry Standard Servers, VMware, Hyper-V, and custom Mitel virtualization platforms. Detailed capacity and scaling information for MiVoice Business platforms are available in the *MiCloud Engineering Guidelines* and in the MiVoice Business engineering guidelines.

MiCollab

MiCollab unifies Mitel applications into an easy to use, cost effective communications solution. The MiCollab applications include:

- MiCollab Unified Messaging – provides voice messaging, unified messaging, fax, and paging support
- MiCollab Speech Auto Attendant – provides speech-enabled auto attendant

- MiCollab Client – provides contact management, dynamic status, instant messaging and audio conferencing
- MiCollab Audio, Web, and Video Conferencing – provides web conferencing, supporting audio, video, chat (text) and presentations
- MiVoice Border Gateway – a specialized application proxy supporting SIP, MiNet, and web protocols
- MiCollab Suite Application Services – provides single point user services provisioning, centralized management of shared system resources and license management; also provides the administrator and My Unified Communications portals.

The UCC applications are described in the following sections. MiVoice Border Gateway is described in the MiCloud Engineering Guidelines. MiCollab Suite Application Services is described in"Management considerations" on page 125.

All of the reference architectures, with the exception of the Small Business architecture, support multiple MiCollab applications. The Small Business architecture provides cost effective unified communications using a multi-tenanted single-application deployment of MiCollab that includes only MiCollab Client.

MiCollab Unified Messaging

MiCollab Unified Messaging is a powerful voice processing application that allows users to manage their voice, fax, and recorded messages. Unified messaging provides users with the capabilities to:

- Send, receive, forward, save, and sort voice and fax messages. Fax message support places more stringent requirements on the IP network as discussed in the MiCollab documentation. See also the *MiCloud Engineering Guidelines*.
- Record mailbox greetings
- Create and manage personal distribution lists
- Play a voice or Record-A-Call message over PC speakers or over the phone
- Record a phone conversation
- Read, print, and send faxes
- Reply to a voice, Record-A-Call, or fax message with a text message
- Forward a message
- Call back the sender of the message

With unified messaging, users can access and manage their messages through one of several interfaces, including:

- Telephone User Interface (TUI) – MiCollab Unified Messaging plays a menu of options and the user selects the desired option using the telephone key pad.
- Visual voice mail – allows users to interact with their voice mail using their phones' display; available on Mitel 5340 and MiVoice 5360 IP phones with MiCollab Unified Messaging integrated to a MiVoice Business system.

- Web View – provides a web-based GUI for managing voice and fax messages.
- E-mail – allows users to manage voice and fax messages using an e-mail client. With SMTP, MiCollab Unified Messaging supports sending a WAV file for voice or a TIFF file for fax. With IMAP or MAPI integrations, messages and Message Waiting Indicators are synchronized between the MiCollab server and the e-mail server.

  MiCollab Unified Messaging also supports an Outlook client plug-in that provides a tool bar that gives the user the ability to reply to, forward, and manage voice messages, and to create and send new voice messages.

MiCollab Speech Auto Attendant

MiCollab Speech Auto Attendant allows internal and external callers to place a call by speaking the name, department name, spoken digits, or DTMF digits for the extension number. The system supports “barge-in”, which allows a user to interrupt a system prompt with a speech or keystroke command.

Speech recognition matches database names to spoken names and extensions. MiCollab Speech Auto Attendant capacity, in terms of the maximum number of names and ports, is described in the *NuPoint Unified Messaging Engineering Guidelines*. Speech recognition is customizable for the relative priority of concurrent speech sessions versus accuracy, and for the sensitivity of the speech detector.

MiCollab Client

MiCollab Client and its multi-tenant variant, MiCollab Client Multi-Tenant provide a single access point for business communication and collaboration. MiCollab brings together the call control capabilities of Mitel communications platforms with contact management, Dynamic Status, and collaboration applications. Key capabilities include:

- Simplified call management and logging – The server logs all incoming calls for the client and updates the client with all cached call log information. The client also provides access to frequently dialed numbers from a drop-down menu.
- Presence and availability – The server automatically tracks and updates presence information including Dynamic Status, telephony, IM and video presence.
- Dynamic status – Provides capabilities to set a status message and optional custom text and manage customized call routing, Instant Messaging and video presence. The status can be changed manually at any time, and updated automatically in response to events. Calendar integration is supported for Google and Microsoft Outlook calendars. With mobile clients, users can also define GPS locations to associate with each dynamic status, which automatically updates status based on GPS location.
- Corporate Instant Messaging (IM) – Allows users to send and receive instant messages and share files. It supports multi-party messaging and federation with external IM servers using Extensible Messaging and Presence Protocol (XMPP).
- Visual voice mail – Provides access to the MiCollab Unified Messaging features, including the ability to receive Message Waiting Indicators, play/view, forward, and delete voice and fax messages.

- Contact Management – Provides access to corporate and personal contacts. Corporate contacts are provided by the MiCollab Client Multi-Tenant Service corporate directory. Personal contacts may be imported from a Personal Information Manager (PIM) or created manually. Supported PIMs include Microsoft® Outlook®, IBM® Lotus Notes®, and ACT!™ (by Swiftpage™).
- Knowledge Management – Allows users to index files and documents associated with a contact. The client presents this list of associated files in a pop-up window when the user receives an incoming call.
- RSS Window – The desktop client may be used to display RSS feeds.

MiCollab Client Multi-tenant (used with multi-instance architectures)

MiCollab Client Multi-tenant offers the subset of MiCollab capabilities supported by MiCollab Client. As a MiCollab single application deployment, MiCollab Client Multi-tenant supports reduced capacities compared to those available with the single-application mode.

Oria provides configuration and provisioning for both MiCollab Client and the associated MiVoice Business instances. Component constraints include:

- MiCollab must be deployed in co-located mode. The MiCollab database does not support tenanting.
- MiCollab User and Service Provisioning (USP) is not supported in MiCollab Client-MT. USP supports Flow Through Provisioning to only a single MiVoice Business cluster. MiCollab can participate in a single data sharing scope.

See the MiCollab Client documentation for details.

MiCollab Client supported clients

MiCollab Client supports several clients that can be integrated with phone capabilities:

- Desktop client – Provides access to all MiCollab Client Service features and supports integration to a desk phone. The desktop client includes an embedded PC soft phone that can be configured for MiNet or SIP protocols. The MiNet version provides extensive telephony features, while the SIP version supports video calling functionality.
- Web portal – Allows web-based access to a subset of MiCollab Client Service features. Users may change their Dynamic Status, access call history data, view corporate contacts, access voice mail messages, and configure account options. The web client is supported on all web browsers. Embedded phone capabilities are supported only on Chrome and Firefox browsers.
- Next Gen Mobile Softphone. The Next Gen Mobile SIP Softphone is designed for easy deployment to the user's mobile device using a link in an e-mail. Next Gen Mobile Softphone is available for Windows® Phone, Android™, iOS®, and Blackberry®. Resiliency is offered for the Next Gen Mobile Softphone. See the MiCloud Deployment Guides and the *MiCloud Engineering Guidelines* for details.
- MiCollab UC Client. Provides a user interface designed for mobile devices. The mobile client includes an embedded SIP soft phone. Mobile client variants are available for Android™, iOS®, and Blackberry®. For more detail, see the *MiCollab Client Engineering*

Guidelines, and the *Mobility and Private Wireless Solutions Guide*, available on Mitel OnLine.

- MiCollab Client Console, Provides attendants with console features and presence information. Supports 60 calls per hour and two simultaneous calls. For higher capacity, the MiVoice Business Console is recommended.

When MiCollab Client is connected to a MiVoice Business network, the desktop client supports hand-off of an active call from the associated phone to another device, and pick up of an active call from another device. The mobile client allows a user to push a call to another device in its multi-device user group.

For most UC solutions, MiCollab Client is deployed within a multi-application MiCollab, providing a rich suite of UC capabilities. The exception is for the Small Business architecture, where MiCollab Client is deployed as a multi-tenanted single application, with a reduced feature set.

MiCollab Audio, Web, and Video Conferencing

MiCollab Audio, Web, and Video Conferencing allows users to schedule and hold audio and web conferences. MiCollab Audio, Web, and Video Conferencing supports three types of conferences: Audio and Web, Audio only, and Web only.

Audio conferences allow users to:
• upload documents to present to callers during a conference call • mute, drop, and add participants, and place individual participants on hold while the call is in progress.
Web conferences allow users to:
• upload documents, transfer files, record the conference, chat on-line, and broadcast videos • share applications or desktop and use white board features.
Users access and manage their conferences using:
• MiCollab Audio, Web, and Video Conferencing Desktop client: Allows users to schedule and join audio and web conferences. The desktop client supports two-way audio participation. • MiCollab Audio, Web, and Video Conferencing Web portal. Allows users to schedule and view conferences with listen only audio support. The web-based interface is integrated into MiCollab End-User Portal.

Conferences can be initiated immediately or scheduled in advance. MiCollab Audio, Web, and Video Conferencing may be integrated with corporate directories and personal address books from Microsoft Outlook and Lotus Notes. Optionally, conference accessibility requires personal identification for added security. MiCollab Audio, Web, and Video Conferencing supports recording conference calls and collaborative sessions for later playback. Call Detail Records (CDR) provide a log of all calls including the dates, times, and call durations for audit and billing purposes.

MiCollab Audio, Web, and Video Conferencing has additional IP network configuration requirements. For detailed networking information, see the *MiCloud Engineering Guidelines*.

MiCollab requirements and capacity

MiCollab runs on the Mitel Standard Linux operating system. It is supported on Industry Standard Servers and as a virtual appliance on VMware platforms. MiCollab is also available as a server appliance with MiCollab software pre-installed on a Mitel-supplied server.

MiCollab capacity depends on the server specifications, and whether MiCollab is being used in multi-tenant or single-tenant mode. Further details about capacity are provided in the *MiCollab Engineering Guidelines*.

MiCollab Components

MiCollab supports both multi-application deployments and single application deployments. For virtual deployments, although all applications are installed in the MiCollab Virtual Appliance OVA, if licenses are applied for only a single application, then it is considered a single application installation.

MiCollab Client deployment

The MiCollab Client Deployment component was introduced for MiCloud 3.0. It resides on the MiCollab server as a separate MSL blade. It handles the deployment integration between MiCollab, Redirect Server (see below), and MiCollab mobile clients.

MiCollab Client Deployment is managed from MiCollab Server Manager, from a separate page. On the MiCollab Client Deployment management page, you can configure the service parameters.

User provisioning is managed by Oria, through the interface with either MiCollab or MiCollab Client Multi Tenant.

No additional licensing is required for access to the Redirect server or the MiCollab Client Deployment blade.

For instructions for enabling MiCollab MiTeam features, see the MiCloud Deployment Guides.

Redirect Server

The Redirect Server is a Mitel cloud service that enables simplified deployment for the MiCollab Next Gen Mobile Clients. The core capability of the Redirect Server is to securely redirect MiCollab mobile clients that are not yet configured to the appropriate MiCollab server to obtain their configuration data.

The cloud service provides high availability through multiple instances of the Redirect Server with synchronized data. MiCollab mobile clients and the MiCollab Client Deployment component may connect to any of the available servers. The server will attempt to connect to a selected Redirect Server, and if it is unavailable, it will try another Redirect Server on the default list. The Redirect Server supports multiple partitions to serve multiple different customer brands. Branding is supported per MiCollab or per MiCollab Client Multi Tenant, not per tenant.

MiCloud Management Gateway

The MiCloud Management Gateway (MMG) provides customized 1:1 NAT capabilities allowing access across VLAN segregated networks, with IP address and TCP/UDP port level security control. The MiCloud Management Gateway is purpose-built for Mitel solutions. It is downloaded from the AMC, and installed as an MSL blade.

For single-tenant deployments with the recommended architecture, customer platforms are deployed on unique VLANs. MiCloud Management Gateway allows connections between applications deployed in the service provider network and applications deployed on customer networks. MMG provides access to multiple customers from a single MMG instance.

For multi-tenant deployments, MiCloud Management Gateway is typically not required. Customer platforms are deployed in a single network domain. Service provider platforms are either in the same domain, with no need for NAT, or segregated in a separate VLAN, accessible by VLAN port tagging.

MiCloud Management Gateway supports up to 100 customer VLANs with up to 1000 connections. For detailed capacity and performance information, see the *Virtual Appliance Deployment Solutions Guide*, available on Mitel OnLine.

MiCloud Management Gateway is available as an OVA for deployment using VMware vCenter.

Management

MiCloud Management Gateway is managed using its built-in management capabilities, which allow:

- configuration of system settings
- configuration of the management and customer networks
- setting the addresses for mapping between service provider addresses and end-customer addresses for the supported platforms

MiCloud Management Gateway cannot be configured or provisioned using Oria.

Licensing

MiCloud Management Gateway is available to service providers. No license is required.

MiContact Center Business

MiContact Center Business provides a modular suite of applications for streamlining contact center management, and enabling voice and multimedia contact center functionality. The applications included in MiContact Center Business are:

- **Contact Center Management (CCM)**. This is the core application. It provides historical and real-time reporting and forecasting for all agents and queues. CCM supports customizable notifications and replay of real-time data, and is also used to configure, manage, and maintain the contact center configuration and database.
    - **MiVoice Business Reporter**. Allows reporting and monitoring of general business extensions and ring groups, including traffic analysis reports.

  - **MiVoice Call Accounting**. Supports call costing to track the cost of incoming and outgoing calls and adjust costs based on carrier reports. Provides services to track subscribers' use of services, and to adjust prices based on fixed rates.

- **Interactive Contact Center**.Allows supervisory control over agent availability and queue states and agent control over their own availability. It includes an interactive visual queue that enables identifying contacts, along with the capability to manually control the position in queue, and view abandoned calls with call back option.
- **Messaging and Routing**. Routes calls to the most appropriate group based on caller and call center statistics, such as type of service, agent skills, agent availability, idle time, and queue conditions. MiContact Center Business supports either Messaging and Routing ports or IVR ports, but not both in the same Enterprise server.
- **Contact Center IVR**. Provides intelligent routing of voice calls based on call meta-data, caller menu choices, and call center statistics. It can be configured to collect and verify information with external data sources, enable callers to request call backs, enable caller self-service capabilities, and run outbound dialing campaigns. Contact Center IVR includes the Visual Workflow Manager tool to facilitate configuration.
- **Multimedia Contact Center**. Provides queuing, inbound and outbound routing, and real-time and historical reporting functionality for e-mail, real-time chats, SMS messages, and social media interactions. Multimedia Contact Center also includes graphical tools to facilitate maintaining workflows. These workflows may include self-servicing and intelligent routing for all media types.
- **Flexible Reporting**. When used with Contact Center Management, allows for the creation and customization of reports based on the contact center data. Reports use a spreadsheet look and feel, allowing a quick learning curve.
- **Workforce Scheduling**, Provides forecasting and automated agent scheduling based on business rules, required skills, and coverage for call volume. Employees are provided with a web-based Employee Portal for use in requesting time off and swapping shifts with other employees (if enabled).

For multi-tenant architectures (like the SB architecture), MiContact Center Business is deployed in multi-tenant mode. MiContact Center Multi-tenant provides contact center management for voice agents, MiVoice Business Reporter capabilities for general non-ACD extensions, and Call Accounting (without call costing capabilities). For multi-tenant deployments requiring call costing, MiVoice Business Reporter is deployed in single-tenant mode, and relies on access control lists to segregate tenants.

For single-tenant architectures, all applications are supported. For multi-tenant architectures, the core applications are supported. Multimedia Contact Center, Flexible Reporting, and Workforce Scheduling are not supported. See Table 14 for a full comparison of single and multi-tenant MiContact Center.

For single-tenant architectures, MiContact Center Business is deployed in single-tenant mode. MiContact Center supports the full suite of contact center applications CC desktops, and web clients. The *Contact Center Blueprint* and *MiContact Center Deployment Guide* provide reference architectures that can be adapted to single-tenant cloud deployments with various capacity and resiliency requirements.

Table 14: MiContact Center applications: single-tenant vs. multi-tenant

MICONTACT CENTER APPLICATIONS	MULTI-TENANT	SINGLE-TENANT
Contact Center Management	√	√
• MiVoice Business Reporter	√	√
• MiVoice Call Accounting	√	√
Interactive Contact Center	√	√
Messaging and Routing	√	√
Contact Center IVR	√	√
Multimedia Contact Center		√
Flexible Reporting		√
Workforce Scheduling		√

For the supported applications, access to the applications and specific capabilities of the applications depend on license entitlements. MiContact Center Business is available in Workgroup and Contact Center license types. MiVoice Analytics provides capabilities for general business extensions, with MiVoice Call Accounting and MiVoice Business Reporter.

MiContact Center Business clients include:

- Contact Center Client (CCC). A supervisor and agent desktop client for use in accessing Contact Center Management and Interactive Contact Center for real-time statistics, data mining, and MiContact Center Business configuration. CCC supports:
  - Contact Center chat. (Chats initiated in CCC are not related to chats initiated in MiCollab Client.)
  - An integrated call recording client that enables agents to start and stop voice recordings, available for single-tenant architectures only.
- CCM Web. A supervisor web client supporting generating, e-mailing, and printing historical reports.
- Ignite. A agent desktop client for use in handling voice and multimedia interactions, adjusting agent group presence, and accessing agent handling statistics. Ignite can be integrated with MiCollab Client to enable advanced call handling functionality.
- Contact Center PhoneSet Manager, A desktop application that enables agents to use their computer for interacting with a desk phone.
- Screen Pop. A desktop application for agents that provides the capability to launch applications and web pages, typically used to provide contact information pulled from databases, such as Customer Relationship Management (CRM) databases integrated with MiContact Center Business.
- CTI Developer Toolkit Client. A desktop application that provides basic telephony capabilities with associated call data and notes.
- Business Reporter Client. A desktop client for general business (non-ACD) users that provides access to Contact Center PhoneSet Manager, Screen Pop, and CTI toolkit client.

- YourSite Explorer. Browser-based access for administrators for use in managing MiContact Center Business configuration and provisioning.

For multi-tenant deployments, support for desktop clients is restricted. Desktop client installation is supported only for use by supervisors. Desk phones or MiCollab soft phones are supported for agents. Administrators and supervisors have access to YourSite Explorer and CCM Web. These restrictions do not apply for single-tenant architectures.

Components

MiContact Center Business runs on Microsoft Windows Servers and requires Microsoft SQL Server. It is supported on Industry Standard Servers and virtualized servers with VMware and Hyper-V. MiContact Center Business desktop clients are supported on Windows desktop operating systems.

Components to be considered include the MiContact Center Business co-located applications: IVR routing, Speech Servers, SQL databases for ACD and SMDR data, and multimedia data repository for all media. Multimedia includes e-mails, SMS, and chat transcripts (excludes voice).

For small deployments, all applications except Speech Server may be co-located on the Enterprise server. For larger deployments, remote servers are used to reduce the load on the primary MiContact Center Business Enterprise server. Components that may be off-loaded to one or more remote servers include:

- Remote MiContact Center Business servers may be used to collect and stream ACD/SMDR data from multiple media servers to the Enterprise Server.
- MiContact Center Business IVR servers may be used to provide resiliency and increased capacity. MiContact Center Business Enterprise server provides a central point for configuration. Depending on loading, the MiContact Center Business Enterprise server may participate as the primary IVR instance, with secondary instances on remote servers, or all IVR routing may be off-loaded to remote servers.
- Speech server must be off-loaded from MiContact Center Business Enterprise server. MiContact Center Business includes Nuance Recognizer for automatic speech recognition for caller speech and Nuance Vocalizer for text-to-speech for IVR routing prompts and Workflow; these may be co-located on the same speech server.
- SQL Server should be off-loaded to a separate server; MiContact Center Business Enterprise server requires SQL Express for internal messaging. This co-located SQL Express may be used for historical reporting data within SQL Express database limits, currently 10 GB. SQL Server is required for historical data if it is expected to exceed SQL Express limits.
- The Multimedia data repository may be off-loaded to separate SAN or NAS data storage.
- Remote Updater proxy for client component pack updates. The MiContact Center Business Enterprise server updates the remote updater proxy. Clients then update from the proxy.

Information about sizing MiContact Center Business servers and deploying resilient IVR ports is available in the *MiContact Center and Business Reporter Engineering Guidelines*.

Management

MiContact Center Business management is performed using a combination of the following tools:

- Oria: provisioning agents and queues
- MiVoice Business System Administration Tool: refining ACD parameters
- MiContact Center Business YourSite Explorer: configuring MiContact Center Business.

More details are available in the MiCloud Deployment Guides and related MiContact Center Business Installation and Management Guides.

For MiCloud Contact Center (MiContact Center Multi-tenant), the Service Provider administrator has access to all provisioned tenants. The administrator can only manage one tenant at a time to prevent cross-tenant modifications. Each tenant has at least one local administrator. The local administrator has access only to configuration and device data for their site. Further information about management constraints for MiContact Center Multi-tenant is available in the *MiContact Center Site-Based Security (Multi-tenant) Administration Guide*.

Licensing

MiContact Center Business is licensed based on activation licenses and monthly subscription reporting licenses including:

- Agent bundles with Basic, Standard, Advanced, and Premium user licenses. Bundles include licenses for MiVoice Business IP User, MiVoice Business active ACD, MiCollab, and Open Integration Gateway integrations.
- IVR routing features with Standard and Premium bundles.
- MiVoice Analytics with two bundles: MiVoice Call Accounting and MiVoice Business Reporter, based on named extensions. There are optional add on licenses for MiVoice Business Reporter clients.
- À la carte licenses for Flexible Reporting and Workforce Scheduling

MiVoice Call Recording

MiVoice Call Recording is a comprehensive call recording application that allows users to capture, archive, organize, playback, and share voice documents. MiContact Center Quality Management, available as an add-on to MiVoice Call Recording, provides a complete suite of quality assurance, evaluation, and e-learning tools. Key capabilities of MiVoice Call Recording include:

- Flexible set of recording rules to always record, record on demand, or record based on specified criteria
- Rich meta-data coupled to recordings, including CTI data such as date and time, duration, parties on the call, and business-specific data such as annotations and reason codes. Meta-data can be used for a variety of purposes, including permissions, searching, recording rules, and retention rules.
- Integrated agent and supervisor chat capabilities to facilitate overseeing and coaching work teams

- Post-call actions, such as e-mailing a copy of the recording to specific users
- Integration with other business applications, such as Salesforce, to create a call record in Salesforce, with a URL to play back the call
- Recordings database tools to stage, archive, and purge recordings
- Digital watermarks that can be used to find out if the recording has been modified
- Comprehensive reporting capabilities, on-demand or scheduled, including usage, customer interaction, employee evaluation, and overall statistics
- Quality management tools to support employee evaluations and track results

MiVoice Call Recording supports several clients adapted to different roles, including:

- Management Studio: Installable client supporting user, supervisor, and administrator functionality that allows managers to efficiently monitor agent interactions in real-time, insert notes and annotations, play back historical calls, search voice documents, and create reports
- Desktop client: User client that allows agents to view relevant information about a call in progress, start and stop recording (provided they have the appropriate permissions), attach information to calls, and chat for coaching assistance
- Navigator: Web client allowing users to search, playback, annotate, and share historical call recordings, and generate reports
- Management Studio Admin: Management client similar to Management Studio, but limited to administrative capabilities for configuration, recording rules, and account maintenance for a single instance of MiVoice Call Recording

For both single-tenant and multi-tenant architectures, MiVoice Call Recording is deployed as a single instance application.

Components

MiVoice Call Recording requires the Windows operating system and is supported on Microsoft Windows 8.1 and Microsoft Windows Server 2012. It is also supported on Industry Standard Servers, and as a virtual appliance on VMware platforms. Several OVAs are available; they are designed to address the 25, 50, and 750 port capacities.

For the deployment, there are several components to be considered, namely the application, the recording files in Patented Voice Document (PVD) format, and the calls to the SQL database, which contains a cached, indexed copy of the PVD metadata with a file-path reference back to each PVD.

The storage requirements for the recording files depend on the total amount of call time recorded and the voice codec. Typically, recording files are moved to a secondary SAN or NAS to provide adequate storage capacity. The size of the SQL database depends on the number of call records that must be maintained. An archive server, similar to MiVoice Call Recording, but without the recording capability, may be used to off-load older calls, reducing the SQL database size while maintaining access to the call recording files. For information about calculating storage capacity, see the *MiVoice Call Recording Engineering Guidelines*.

A single server can host both the application and the SQL server, with recording files on the local disk or NAS. For large sites or multiple geographically-dispersed sites, multiple MiVoice Call Recording applications can be networked together, locally or across a WAN. One server acts as the primary node, with one or more secondary nodes. Recording files are stored relative to their original call recording server. The primary server maintains the combined calls database.

For recording, the MiVoice Call Recording requires an audio stream. For cloud deployments, the audio stream is typically provided by the MiVoice Border Gateway-Secure Recording Connector (SRC). For multi-tenant deployments, the shared MiVoice Border Gateways that support Teleworkers are used to provide the audio tap. Adding SRC functionality affects the capacity of the MiVoice Border Gateway and cluster sizing must to be adjusted. For single-tenant deployments, the Teleworker MiVoice Border Gateway can be used for Teleworker MiNet end-points and the MiCollab integrated MiVoice Border Gateway can be used for LAN MiNet end-points. Multiple MiVoice Border Gateway-SRC may be required to fulfill the capacity requirements.

MiVoice Call Recording also supports other sources for the audio streams, such as IP port mirroring, analog or digital tap cards, IP end-point streams (indirect recording). These alternate options are not recommended or supported for cloud deployments.

Management

MiVoice Call Recording management is performed using the embedded management capabilities. Management Studio or Management Studio Admin clients provide configuration and provisioning capabilities for a single instance of MiVoice Call Recording. For the multi-instance application, Multi-instance Manager provides access to system-wide settings, and capabilities to manage individual instances.

MiVoice Call Recording cannot be provisioned or configured through Oria.

Licensing

For service provider licensing, call recording is available as additional add-on licenses for concurrent call recording audio ports and optional licenses for MiContact Center Quality Management users.

Related licenses include MiVoice Border Gateway-SRC channel licenses, MiVoice Border Gateway G.729 compression licenses, and MiVoice Business ACD licenses.

Mitel Open Integration Gateway

The Mitel Open Integration Gateway (OIG) is a web server offering an open, standards-based Web Services applications programming interface (API). Together with MiVoice Business, the Mitel Open Integration Gateway delivers seamless integration of unified communications and third-party business applications, enabling faster, more effective communications for your customers.

Mitel Open Integration Gateway supports three web services:

- Session Management Service. Manages the communication session with Mitel Open Integration Gateway for services

- Call Control Service. Controls and monitors CTI behavior in connected MiVoice Business controllers
- Data Access Service. Provides data change notifications and read access to MiVoice Business configuration data.

The Call Control Service is available at two levels:

- Standard Call Control. Allows an application to monitor and control the telephony activity of Mitel physical and logical devices. These are devices programmed or configured in a MiVoice Business controller, including IP phones, Personal Ring Groups and line appearances on multi-line phones. The Standard Call Control Service allows applications to control and monitor a Mitel desktop phone in a manner similar to that of a user manually controlling the phone.
- Advanced Call Control. Includes third-party call control capabilities and offers a full suite of functionality from simple call control to contact center monitoring and control. Advanced Call Control Service provides monitoring and control of MiVoice Business functions, e.g., Hot Desk Agent login (Internal and External), Trunking, Ring Groups, Hunt Groups, ACD2, and ACD Express. Control relates to functions not normally associated with a specific desktop phone user. Support for MiVoice Business level monitoring (e.g., all conferences within a MiVoice Business) is included. Advanced Call Control also allows setting the phone message waiting lamp and auto answer.

Mitel OIG offers a single point of access to web services available within a Mitel communication system. An application opens a communication session with a OIG. When authenticated and authorized, the application can use this communication session to access all Mitel Open Integration Gateway web services that the application is authorized to use. Mitel OIG provides full equivalence to the legacy MiTAI Call Control API, including support for MiVoice Business resiliency.

Mitel offers two MiVoice Integration applications:

- MiVoice Integration for Salesforce: Uses a hosted Salesforce server and the Salesforce AppExchange
- MiVoice Integration for Google: Uses a hosted Google server and the Google Chrome Web Store

Further information about the MiVoice Integration applications is available in the MiVoice Integration administrator guides and user guides, available on Mitel OnLine.

Additional applications include those available from third-party developers who provide horizontal and vertically-focused CRM and ERP integrations, such as for Oracle, SAP, and Microsoft.

Mitel provides comprehensive documentation, training, sample applications, and hosted Mitel Open Integration Gateway virtual lab access to allow customers to integrate their business applications with the OIG API. All applications must be registered with Mitel as either Standard or Advanced applications. Advanced applications require a Mitel certificate to use the Mitel Open Integration Gateway Advanced services.

Information about capacity, including maximum number of applications supported, MiVoice Business connections, events per second, operations per second and MiVoice Business impacts, is available in the *Mitel Open Integration Gateway Engineering Guidelines*.

Mitel OIG runs on Mitel Standard Linux and is available for deployment on physical or virtual servers. OIG does not support co-residency with other applications.

MiCloud CRM Integrations

MiCloud CRM Integration enables Mitel call control, natively launched from many of the most common Customer Relationship Management applications. It uses Mitel Open Integration Gateway (OIG) to communicate with MiVoice Business call control to give contact center workers. Each Customer needs a dedicated OIG and can have one supported CRM.

MiCloud CRM Integrations is a cloud service, used with your customer's CRM. It allows contact center workers to make and receive calls directly from their Google Chrome browser, with pop-ups for all CRM functions and reminders.

Customer relationship managers supported for MiCloud Business 3.3 are the following. More CRM applications are being added regularly. Check the *Mitel CRM Integrations Administration Guide* for the up-to-date CRM list and the features available for each license level.

- Salesforce - Professional and Enterprise Editions
- Oracle® Sales Cloud - All Versions
- SugarCRM - versions 6 and 7
- Netsuite - all versions
- Zendesk- all versions
- Infusionsoft
- Microsoft Dynamics® - Dynamics 2016, Dynamics 365 (Note that Skype services must be uninstalled to ensure that Click-to-dial is operational.)

Licensing

MiCloud CRM Integrations requires the purchase of licenses for the MiCloud CRM Integrations service, plus licenses for Mitel Open Integration Gateway.

Install an Open Integration Gateway for each Customer you will be deploying. License each OIG with the Subscription/CapEx Base Kit. Add an Advanced Control Server license if you need to support ACD Agent Monitoring.

See the *MiCloud CRM Integrations Admin Guide* and the *Open Integration Gateway Installation Guide* for detailed licensing information.

Mitel Business Analytics

Mitel Business Analytics is an intuitive business productivity tool that allows businesses to monitor call activity and call metrics using real-time reports, dashboards, and wall boards. Managers can view hourly call activity, percentage of calls answered, abandoned calls, unresolved missed calls, and call summaries by user, DDI, or customer CLI. Dashboards display

graphs and tabular data with click-able drill-down to view the detailed reports. Wall boards support display of information on a big screen or desktop.

Mitel Business Analytics is packaged with two options.

- Insight. Includes essential business reports with pre-defined dashboards and wall boards
- Report. Offers enhanced call reporting and analytics, including analysis for ACD call queues, with configurable dashboards and customizable reports

Components

Mitel Business Analytics is offered as a cloud service. In the service provider network, a Windows server acts as a Collector Node, collecting SMDR records from MiVoice Business and establishing a secure connection to the cloud-based servers.

The Delivery Controller runs on the Windows operating system. It is supported on Microsoft Windows 7 and 8, and Microsoft Windows Server2008 R2 SP1 and 2012. It is supported on Industry Standard Servers and as a virtual appliance on VMware platforms. The Delivery Controller provides preprocessing of the SMDR records. Customer access is provided using web-based interfaces from desktops or mobile devices using iOS, Android, or Windows operating systems.

For detailed specifications, see the *MiCloud Engineering Guidelines*.

Management

Mitel Business Analytics offers web-based management access supporting customer self-provisioning and subscription management tools. Administrators may add, edit, and delete extensions, divisions, departments, and cost centers. Configuration changes may be synchronized on-demand or overnight with the MiVoice Business, which adds user names and other data to the configured extensions.

There are two types of user accounts:

- Administrator accounts allow full access
- Standard User accounts allow full access to the services, except for the ability to make configuration changes

Licensing

Mitel Business Analytics is licensed based on the services used, typically offering pay-as-you-go pricing, seat-based pricing, or customer-based pricing.

Vidyo

MiCloud offers immersive video capabilities through partnership with Vidyo. Vidyo provides a video conferencing solution supporting point-to-point and multi-point video, audio, content sharing, and collaboration. The Vidyo solution enables high definition, low-latency, and error resilient video communications to mobile, desktop, and meeting room end-points, dynamically

optimizing performance for each end-point over any IP network. Vidyo services are available with several options:

- Normal. Provides a virtual room for end-users
- Executive. Allows priority users to connect without an available concurrent user license
- VidyoRoom. Supports physical room systems with specialized hardware appliances running embedded software clients
- Panorama. Supports physical room systems with multiple screens

Vidyo users are authenticated based on the specific licensed service type. Vidyo supports several clients:

- VidyoDesktop
- VidyoMobile
- VidyoWeb
- VidyoRoom
- VidyoPanorama
- Vidyo access to rooms (H323 and SIP clients)

For single-tenant architectures, MiCollab supports integration to Vidyo services for provisioning and control of the Vidyo client. Through the integration, MiCollab sends provisioning information to the VidyoPortal and handles authentication of users.

MiCollab Client desktop or mobile thick client provides integrated UI capabilities to:

- allow end-users to join their personal meeting room
- join a contact's personal meeting room
- allow guests to join their personal meeting room using a URL
- allow guests to join a physical meeting room using a URL

MiCollab Client users without Vidyo services may accept invitations to Vidyo meeting rooms as a guest, but will not have their own personal meeting room. Non-MiCollab Client users may be invited to join Vidyo meeting rooms using an e-mail or other media, with the invitation including the room URL.

For multi-tenant architectures, Vidyo services are provisioned using the VidyoPortal, and a Vidyo client provides end-user access.

Components

It is recommended that service providers source hosted Vidyo services from Mitel Cloud Services. When using Mitel Cloud Services hosting, Vidyo is available as a cloud-based service with clients that can be downloaded. The Vidyo service is accessible through several Vidyo components, including:

- VidyoPortal. Call control and management
- VidyoRouter. Media routing and video optimization

- VidyoGateway. Provides an interface to H.323 and SIP based devices
- VidyoReplay. Provides conference recording and web-casting

For multi-tenant architectures supporting Vidyo integration, MiCollab adds a Vidyo blade that connects to the Vidyo portal using a web services API. This additional blade is used for provisioning and authentication services, and does not affect the capacity of the MiCollab server.

Management

For multi-tenant architectures, Oria supports provisioning of Vidyo services through an interface with MiCollab, and Vidyo services may be included in Oria user bundles.

Using the embedded management tools, MiCollab Server Manager includes:

- **Vidyo Settings** tab. Use for configuration of the Vidyo integration
- **User and Services** tab. Use for provisioning Vidyo services using roles and templates

Administrators may also log in to the VidyoPortal to perform specialized configuration actions not available through Oria or MiCollab.

MiCollab Client desktop or mobile thick client manages:

- Installing, and upgrading the Vidyo client
- Starting the Vidyo client
- Instructing the Vidyo client to authenticate the user using the MiCollab Client credentials

There is no integration between MiCollab Client Multi-tenant and Vidyo for provisioning. The Vidyo user services are not available using the MiCollab Client desktop or mobile clients.

For single-tenant architectures, there is no management integration. Vidyo services are managed directly through access to the Vidyo Portal.

Licensing

It is recommended service providers source Vidyo services from Mitel Cloud Services. Mitel offers Vidyo licensing based on named users.

Emergency Response Adviser

The Emergency Response Adviser (ER Adviser) is an application that provides an emergency call display and response console for local security personnel. The ER Adviser is suitable for enterprise on-premise or cloud deployments. Service provider deployment is not supported. The ER Adviser capabilities include:

- A visual and optional audible alert for new emergency calls
- Display with the location of the phone used to dial the emergency number, and any available extra information such as door access codes or user health information
- Support for pager messages and e-mail messages to a pre-configured distribution list

- Detailed logs of emergency calls and system generated events. Logs may be displayed, formatted into text files, or exported as XML or CSV files.
- Generation of a National Emergency Number Association (NENA) standard ALI database update file which can be sent to the PSAP

The ER Adviser provides additional functionality to the emergency service features offered by the MiVoice Business. The MiVoice Business performs the routing of emergency calls to the Public Safety Answering Point (PSAP). The public emergency response occurs independent of the ER Adviser, using facilities owned and maintained by the telephone company and PSAP service provider. The ER Adviser is used to alert local security personnel. With display of the local number, security personnel may join in the call to listen to the conversation.

Components

The ER Adviser is a light-weight windows application. Supported operating systems and server specifications are available in the *Mitel Emergency Response Adviser Installation and Maintenance Guide*.

ER Adviser works with standard domain-based user group management system, and supports three user groups:

- ER-Administrator. Allows access to all features and functionality of the ER Adviser application
- ER-Help desk. Allows access to features, with the exception of scheduled tasks and database back-up and restores
- ER-User. Designed for those responsible for monitoring the ER Adviser for received emergency calls. Restricts access to key operational areas of the application

The ER Adviser supports the main terminal associated with the application server and remote consoles.

Chapter 5

USERS AND DEVICES

Users and devices

This section discusses end-users, IP desktop devices and applications, IP conference units, and specialty end-points.

For information related to network Quality of Service, end-point configuration, and infrastructure requirements see the *MiCloud Engineering Guidelines*.

Types of users

The Mitel portfolio of devices and applications are designed to meet the communications requirements of a wide range of end-users. When selecting end-points for a UC solution, consider the following types of users, their requirements, and the system design implications.

Table 15: User types

END-USER TYPE	DESCRIPTION
Public telephony	Phone deployments that fall into this category are publicly-accessible phones, such as: lobby phones, cafeteria phones, hallway phones and classroom phones. These users need to be able to place calls and receive calls. UC capabilities are not required. The extension number for these phones is attached to a physical location rather than to a user.
Basic telephony	Some employees may require only basic telephony services at their desktops or workstations. This includes factory and production workers, cashiers, and retail clerks. These users do not usually require UC capabilities, but they may require access to voice mail. Unlike public phones, the extension number for these phones is attached to a specific user.
Basic user - desktop and Teleworker	This type of user requires basic telephony services and may also require multi-line support and the ability to access basic MiVoice Business UC applications from their desktops. These users would typically be office workers, lab workers, SOHO* workers, or Teleworkers.
Power user - desktop and Teleworker	The power user requires basic telephony services, multi-line support and the ability to access more MiVoice Business UC applications from their desktops than the basic user. These users would typically be office managers, administrative staff, SOHO* workers, or Teleworkers.
Executive user	This user requires basic telephony services, multi-line support, and the ability to access the full range of MiVoice Business UC applications from their desktops. As the name suggests, these users are typically executives, managers, and users in supervisory roles.
Executive user (with Internet/Intranet access)	This user has the same requirements as the executive user, plus the ability to access the Internet or Intranet. These users are typically executives/users who need the ability to access Web-based information without using a PC.

* SOHO — Small Office/Home Office

Different types of end-users generate different call traffic patterns, these call traffic patterns and the resulting call processing loads must be taken into account.

For information about call patterns, traffic, and MiVoice Business call handling performance refer to the *MiVoice Business Engineering Guidelines* and the *MiVoice Business System Engineering Tool,* available on Mitel OnLine.

Note: The Mitel UC licensing model uses naming conventions similar to the user names described above. In most cases, the user type fits with the similarly named UC license, however, this is not required. A particular user type may select any of the set types or UC licenses as required for their communication needs, and there is no correlation between the names used for UC licenses and the names used to describe types of users.

Mitel IP desktops

Mitel has one of the most comprehensive portfolios of IP desktop devices and applications in the industry. These solutions give users easy, intuitive access to the feature-rich telephony and advanced desktop applications enabled by Mitel IP communications platforms.

- "MiVoice IP Phones" on page 114
- "SIP desktop devices" on page 116
- "Mitel IP desktop applications" on page 117

MiVoice IP Phones

MiVoice IP Phones address a range of applications, from basic lobby phones to feature-rich executive phones. This section provides a basic overview of the available MiVoice IP Phones for the range of MiCloud Business Solution architectures.

For additional about MiVoice IP Phones, the following documents available on Mitel OnLine:

- MiVoice IP Phones and Peripherals Feature Matrix
- Mitel IP Telephone Data Sheets (specifications and supported standards)
- Mitel IP Desktop FAQ
- Mitel IP Telephone Product Bulletins
- *Mitel IP Sets Engineering Guidelines* (Discusses power requirements, required infrastructure and deployment)

Table 16: Supported Mitel IP phones

MITEL IP DESK PHONE	TYPICAL PHONE CLASS	APPLICATION	FEATURE PROGRAMMABILITY
MiVoice 5304	Basic - IP display phone	Public areas (lobbies, guest rooms, classrooms, retail)	Basic - access to MiVoice Business-enabled apps
MiVoice 5312	Entry level - key system phone	Basic user - desktop and Teleworker	Basic - user programmable access to MiVoice Business-enabled apps

Table 16: Supported Mitel IP phones

MITEL IP DESK PHONE	TYPICAL PHONE CLASS	APPLICATION	FEATURE PROGRAMMABILITY
MiVoice 5324	Mainstream - key system phone	Power user - desktop and Teleworker	Expanded - user programmable access to MiVoice Business-enabled applications
MiVoice 5320	Entry - business phone	Basic user - desktop and Teleworker	Basic - user programmable access to MiVoice Business-enabled applications
MiVoice 5320e	Entry - business phone	Basic user - desktop and Teleworker	Basic - user programmable access to MiVoice Business-enabled applications
MiVoice 5330e	Mainstream - business phone	Executive and supervisory desktops	Full feature and advanced UC capabilities
MiVoice 5340e	Premium - business phone	Executive and supervisory desktops	Full feature and advanced UC capabilities
MiVoice 5360	Premium - business phone	Internet/Intranet appliance for executive and supervisory desktops	Full feature, advanced UC capabilities and Internet/Intranet Access
MiVoice 5220	MiNet phone	Supports Hot Desk users	MiVoice Border Gateway Device programming (MiNet MBG)
MiVoice 6920*	Entry - MiNet business phone	Enterprise user	Full feature and advanced UC capabilities
MiVoice 6930*	Standard - MiNet business phone	Power user	Full feature and advanced UC capabilities
MiVoice 6940*	Premium - MiNet business phone	Executive power user	Full feature, advanced UC capabilities and Internet/Intranet Access

Note: MiVoice 6900 Series phones are supported with MiVoice Business Release 8.0+.

SIP desktop devices

Mitel supports a number of Mitel SIP telephones and third-party SIP telephones that have been verified for interoperability with Mitel products.

Table 17: Supported Mitel SIP phones

MITEL SIP DESK PHONE	TYPICAL PHONE CLASS	APPLICATION	FEATURE PROGRAMMABILITY
MiVoice 5604	Wireless SIP DECT phone	Business phone for outdoor and industrial use Cannot be used as a Hot Desk Phone	Basic wireless desk phone
MiVoice 5624	Wireless SIP DECT phone	**B**usiness phone for outdoor and industrial use Cannot be used as a Hot Desk Phone	Basic wireless desk phone
Mitel 612	Wireless SIP DECT phone	Basic model for the business sector	Basic wireless desk phone
Mitel 622	Wireless SIP DECT phone	Basic model for the business sector, plus Bluetooth interface	Wireless desk phone with 8 programmable keys Replaceable SD card
Mitel 632	Wireless SIP DECT phone	Business phone for outdoor and industrial use	Rugged use wireless phone Replaceable SD card
Mitel 650	Wireless SIP DECT phone	High-end wireless phone	Wireless desk phone with 8 programmable keys CAT-IQ 1.0 certified Replaceable SD card

The Mitel SIP Center of Excellence (SIP CoE) performs interoperability testing between third-party devices and Mitel products. The CoE generates documents that cover the results of the interoperability tests and how the devices should be configured for successful inter-operation.

For the complete list of supported third-party SIP devices, see the Knowledge Base article called *Mitel Technical Reference Guide: Mitel Compatibility and Third-Party Certification Reference Guide for Mitel Products, 08-5159-00014*. This guide also lists the available SIP configuration guides, published as Knowledge Base articles, and where to find them. The SIP configuration guides provide configuration recommendations for SIP servers and SIP end-points.

The *Mitel Technical Reference Guide* guide is available on Mitel OnLine under **Support** > **Technical Support** > **SIP Center of Excellence**. (You must be logged in to Mitel OnLine.)

Mitel IP desktop applications

Mitel offers the following desktop applications. These applications run on IP desktop phones to improve the user experience and drive employee productivity.

For more information about Mitel IP desktop applications, see the product information on Mitel OnLine.

- Live Content Suite - Live Content Suite enables the creation and publishing of dynamic and personalized information to end-users, transforming Mitel MiVoice 5320e, 5330e, 5340e, and 5360 IP Phones into rich media information appliances. Live Content Suite improves employee communications by providing easy access to the information they need, when they need it, and where they need it, on their phones.
- Live Blogger - allows corporate executives to deliver custom content to employees' phones to communicate important written messages to the phone. Another useful function of this application is the ability to obtain information updates via RSS feeds directly on the desktop phone.

Mitel IP desk phone peripherals

Desktop functionality can be extended via a range of add-on peripherals and accessories that are designed to provide the end-user with more choice and flexibility.

Table 18 shows the available Mitel IP peripherals.

Table 18: Mitel IP peripherals

		SUPPORTED PHONES								
MITEL IP PERIPHERAL	DESCRIPTION	MIVOICE 5324	MIVOICE 5330	MIVOICE 5330E	MIVOICE 5340E	MIVOICE 5360	MIVOICE 5610	MIVOICE 6920	MIVOICE 6930	MIVOICE 6940
Mitel 5610 DECT handset and IP DECT stand	The Mitel 5610 DECT Handset and Mitel IP DECT Stand offer a low cost wireless solution for personal area mobility on IP Phones.						✔			
Mitel Cordless (DECT) Accessories	A cordless (DECT) handset and a cordless (DECT) headset are available for IP Phones. These accessories allow users to roam up to 300 feet away from their desk phone.		✔	✔	✔	✔				
Mitel Bluetooth® accessories	A Bluetooth handset is offered that provides corridor mobility for Mitel IP Phones.		✔	✔	✔	✔				

Table 18: Mitel IP peripherals

		SUPPORTED PHONES								
MITEL IP PERIPHERAL	DESCRIPTION	MIVOICE 5324	MIVOICE 5330	MIVOICE 5330E	MIVOICE 5340E	MIVOICE 5360	MIVOICE 5610	MIVOICE 6920	MIVOICE 6930	MIVOICE 6940
Supports USB Bluetooth® dongle	A USB dongle that allows connection of the user's mobile phone to access many of the features of their mobile phone from their desk phone.							✔	*	*
Mitel Line Interface Module (LIM)	The LIM integrates with IP Phones and provides a connection to an analog line that is secondary to the IP connection to support Teleworker resiliency and local emergency call support.	✔	✔	✔	✔	✔				
Mitel Programmable Key Modules (PKMs)	Mitel PKMs allow for the addition of 12 or 48, or up to 96 buttons to the existing programmable keys on IP Phones.	✔	✔	✔	✔			✔	✔	✔

Note: *MiVoice 6930 and MiVoice 6940 IP Phones have embedded Bluetooth®.

For additional information, refer to the product documentation on Mitel OnLine and the *Mitel IP Sets Engineering Guidelines*.

Mitel IP consoles

The following Mitel IP Consoles are intended for use by attendants, receptionists, and operators. For additional information about Mitel IP Consoles, see the product documentation on Mitel OnLine.

MiVoice Business Console

The MiVoice Business Console supersedes the 5550 IP Console; the 5550 IP Console is no longer supported. Customers using the 5550 IP Console should upgrade to the MiVoice Business Console.

The MiVoice Business Console is a soft console application with all audio and telephony functions (voice, call announcement and tones), plus keyboard input integrated into the PC application.

The MiVoice Business Console enables operators to handle a large volume of calls. It is targeted at businesses with over 100 users and offers advanced capabilities such as transfer assistant, presence, and busy lamp integration.

The MiVoice Business Console can be deployed on the customer's LAN (or via an MPLS connection) with full UC capabilities and resiliency. The UC functions, presence, and chat are not supported when the MiVoice Business Console is used as a Teleworker through the MiVoice Border Gateway. The MiVoice Border Gateway supports resiliency to primary and secondary MiVoice Business call controllers.

Mitel 5540 IP Console

The Mitel 5540 IP Console is the ideal attendant solution for small and medium businesses using the MiVoice Business solution. The 5540 IP Console can be used as an attendant console, a sub-attendant position for departments or work groups, or as a back-up answering position. Affordable and simple, a broad range of standard and specialty functions make the 5540 IP Console the practical choice for small-business or hospitality customers.

Specialty end-points

The Mitel product portfolio contains a number of specialty IP and SIP end-points, which are described in the following section. See the product documentation on Mitel OnLine for more information on any of the specialty end-points.

MiVoice Conference Phone

The MiVoice Conference Phone is an audio conference bridge with in-room collaboration. The MiVoice Conference Phone provides audio conferencing with local presentation capabilities.

MiVoice Conference Phone supports audio conferences with a maximum of four parties, natively within the Conference Phone (that is, the Conference Phone plus three external participants) plus the ability to set up an additional consultation call with an external party.

MiVoice Video Phone

The MiVoice Video Phone with Remote Collaboration provides the same functionality as the MiVoice Conference Phone with In-room Collaboration while also enabling remote presentation and multi-party video conferencing functionality.

The MiVoice Video Phone supports video conferences with a maximum of four parties natively within the MiVoice Video Phone, for example the MiVoice Video Phone plus three external participants. One of the external participants can be a link into another video conference bridge.

MiVoice 5505 Guest IP Phone

The MiVoice 5505 Guest IP Phone provides a unique hospitality feature set for hospitality customers who are looking to deploy IP telephony to the guest room. The 5505 Guest IP Phone base provides the physical features hotel guests have come to expect. The 5505 Cordless Handset provides industry-leading features through its built-in, two-line back-lit display. With an operating range of up to 50 meters (150 feet) from the phone base, the 5505 Cordless Handset is ideal as a second phone for a guest room or a suite of rooms.

Third-party end-points

Mitel supports a number of third-party end-points such as SIP-based Analog Terminal Adapters (ATA), alarm interfaces, and door openers.

See the Mitel SIP Center of Excellence for a list of devices that have been tested for interoperability. Contact Mitel Professional Services for additional information.

MiCollab Desktop Client and MiCollab mobile clients

This section describes the MiCollab Client end-points.

MiCollab Desktop Client

The MiCollab Desktop Client is an application that is installed on the user's Windows desktop computer or Microsoft Surface Pro tablet. The MiCollab Desktop Client allows users to control their IP desk phone and associated devices from their computer or Microsoft Surface Pro tablet. The MiCollab Desktop Client includes an embedded softphone, providing users with two devices, if both are configured on the PBX. The softphone requires a separate license.

The MiCollab Desktop Client allows users to search their corporate directory, check visual voice mail, and automatically update their presence status and call routing preferences based on their location or the time of day.

For additional information about MiCollab and MiCollab Desktop Client, see the MiCollab Client documentation.

MiCollab for Mobile

MiCollab for Mobile clients are designed for a simpler and cleaner interface, and a simplified deployment method.

MiCollab for Mobile clients are provisioned through Oria and the new MiCollab Client Deployment blade, and deployed through an e-mail link sent to the mobile device.

MiCollab mobile client

MiCollab mobile client is a suite of Unified Communication applications; the mobile client can be installed on supported BlackBerry®, Android™, and iPhone® / iPad®devices and extends key MiCollab Client capabilities to mobile users.

MiCollab mobile client is a stand-alone client that users install on their mobile device. The client provides automatic dynamic status updates based on the user's current location. In addition, the client provides access to call logs, messages, corporate contacts, and OfficeLink calling capabilities.

- For BlackBerry and Android, location options include GPS and Bluetooth.
- For Android, and iOS devices, an integrated SIP softphone allows calling over Wi-Fi or 3G/4G data networks.

For additional information about MiCollab and MiCollab Mobile Clients, refer to the *Mobility and Private Wireless Solutions Guide* and the product documentation.

Other MiCollab clients

MiCollab Client Web Portal

The MiCollab Client Web Portal provides an intuitive tabbed interface for remote access to MiCollab Client features from a supported Web browser on the user's computer.

Refer to the *MiCollab Engineering Guidelines*, for detailed information about MiCollab connections to the MiVoice Border Gateway and security certificates.

Chapter 6

MANAGEMENT AND BILLING

Management considerations

Management of the UC solution can be divided into a few major aspects:

- System configuration. Managing installs and updates and setting system wide configuration parameters. This is typically undertaken by a system administrator with access to management applications and embedded system management tools.
- User and service configuration. Managing re-usable roles and templates for different types of users and services. For a managed service, these templates would typically be defined by the service provider or reseller. For an enterprise, these templates would be managed by the user or group administrator.
- User and service provisioning. Adding, updating and deleting users and their related devices and services, typically undertaken by the end-customer administrator using an administration portal.

Note: For detailed guidance for user provisioning, see the MiCloud Deployment Guides.

- User administration. Management and administration for individual end-user services. This is typically undertaken by the user using a user-facing portal.
- Technical support. Manages the underlying network and server infrastructure and performs alarm management and troubleshooting of UC systems. This is typically done by technical staff and IT support staff.
- Customer support. Provides technical and administrative support to end-user administrators. This is typically undertaken by customer support staff in the service provider or reseller.

Mitel provides a comprehensive suite of management tools to support Mitel applications. These management tools are designed to provide different levels of access with varying scopes as appropriate for the different management roles.

- “Management applications” on page 125 - Provides an overview of Mitel management applications.
- “Embedded management tools” on page 131 - Describes the embedded management tools and various system capabilities that simplify provisioning.
- “Architecture-specific considerations” on page 137 - Discusses the recommended approach for managing different UC architectures
- “Billing considerations” on page 139 - Discusses billing for each of the architectures

Management applications

Mitel provides management applications designed for specific scenarios, which include:

- “Oria” on page 126 – Used by service providers to manage multiple customer systems
- “Mitel Performance Analytics” on page 127 – Used by both service providers and enterprises for enhanced fault and performance management

- “MiVoice Business Software Installer” on page 130 – Used to upgrade multiple MiVoice Businesss concurrently
- “Mitel Redirection and Configuration Service” on page 130 – used to auto-configure Mitel IP phones.

This section provides a brief overview of these stand-alone applications. Embedded management applications are described in “Embedded management tools” on page 131.

Oria

Oria, a server application typically hosted in a data center, is a customer provisioning application allowing service providers to deliver multi-customer communications services. Oria is not available for enterprise deployments. Oria allows customer management through two different portals, Service Provider Portal and Customer Administration Portal.

The Oria Service Provider management portal is accessible directly, either via a firewall into the public network infrastructure, or via the recommended Web Proxy connection through one of the main user MiVoice Border Gateways.

The Service Provider Portal offers the following management capabilities:

- Automated creation of new end-customers using creation and execution of “blueprints” for installations that use MiVoice Business Multi Instance.
- Services provisioning process. Supports registering MiVoice Business, MiCollab, and MiVoice Border Gateway instances to customers, and defining service bundles.
- Initial user provisioning by importing from an Active Directory database (helps convert LDIF file to an Oria bulk import file).
- Customer and user information aggregation. Captures information from multiple MiVoice Business instances and aggregates it into a single point of access.
- Billing and operations integration. Collects all information on new or modified user bundles. The information can be easily viewed and exported to a billing system and/or operations support system. A standards-based web service interface is provided for integration.
- User profiles. Supports unique profiles for personnel, allowing customized access to sensitive information and capabilities.
- Branding. Customizable UI elements in the portal interface allow increased brand awareness, including complimentary banner advertisements.

The Customer Administration Portal offers the following management capabilities:

- End-customers have access for viewing the configuration information and customizing the phone services for which the service provider has granted permissions.
- Different management levels can be set up for end-customer administrators and users.
- Customers can create accounts and assign packages to phone users, set up business hours, and auto attendants for their company, for example.

With simplified deployment of services and self-service portals, Oria enables service providers and resellers to cost effectively deliver communications services to many small and medium businesses through a direct or indirect sales channel.

Licensing

For service providers, Oria is a required component that must be deployed as part of the MiCloud Business Solution, and is included in the commercial licenses for MiCloud voice and MiCloud UC. Oria license costs are built into the UCC licensing models.

Oria is not available through the partner channel for enterprise deployments.

Mitel Performance Analytics

Mitel Performance Analytics provides remote fault and performance monitoring and management for UC systems and the associated networking infrastructure. Continuous monitoring allows early identification of problems, and Mitel Performance Analytics tools deliver faster problem resolution and reduced down-time. Key capabilities include:

- Comprehensive health monitoring. Monitors, tracks, and analyzes the status and performance of the network infrastructure, with particular focus on Mitel UC systems. Mitel Performance Analytics delivers monitoring of IP QoS and IP Service Level Agreement (SLA) assurance. Key performance metrics provided include voice quality, trunk utilization (digital/SIP), interface availability, IP set inventory/connectivity status, CPU and memory utilization, disk usage, IP CoS for Cisco routers, and Windows services (running/non-running).
- Fault Management. Manages system alarms and configurable threshold alarms. Threshold alarms are customizable and can be created to monitor memory utilization, voice quality, device availability and reachability, interface availability, and license status. Mitel Performance Analytics provides notifications by e-mail, SMS, and Twitter direct messages.
- Active Testing Tools. Conveniently available from the Mitel Performance Analytics dashboard, active testing tools include remote IP set network test. This tool is launched from the voice quality panel, and runs IP Traceroute directly from IP sets on MiVoice Business to a far-end IP address. Other testing tools include remote DNS, Ping, Traceroute, and SNMP browser, plus an integrated web proxy for high performance access to MiVoice Business management tools.
- Backups and SMDR collection for MiVoice Business. Supports scheduled and on-demand backups for MiVoice Business, including the database, with optional voice mail and call history backup. It provides secure off-site cloud-based backup or on-premise storage, with a download-able file for use when restoring. It collects SMDR records from MiVoice Business with on-premise or secure cloud-hosted storage.
- Monthly and on-demand reporting. Key performance metrics are available in customer or service provider-branded reports to assist with planning and forecasting, assurance for SLAs, and ongoing maintenance.
- Enhanced user interface with customizable dashboard. Displays alarms with color-coded locations, and status with both historical and current views. It supports ticket management display and export of alarms to the ticketing system, and provides a brand-able and customizable layout. It also supports multi-tenancy with service provider and customer views.

- Secure remote access. Provides on-demand connection to a remote LAN without the need of a VPN with full encryption/authentication.

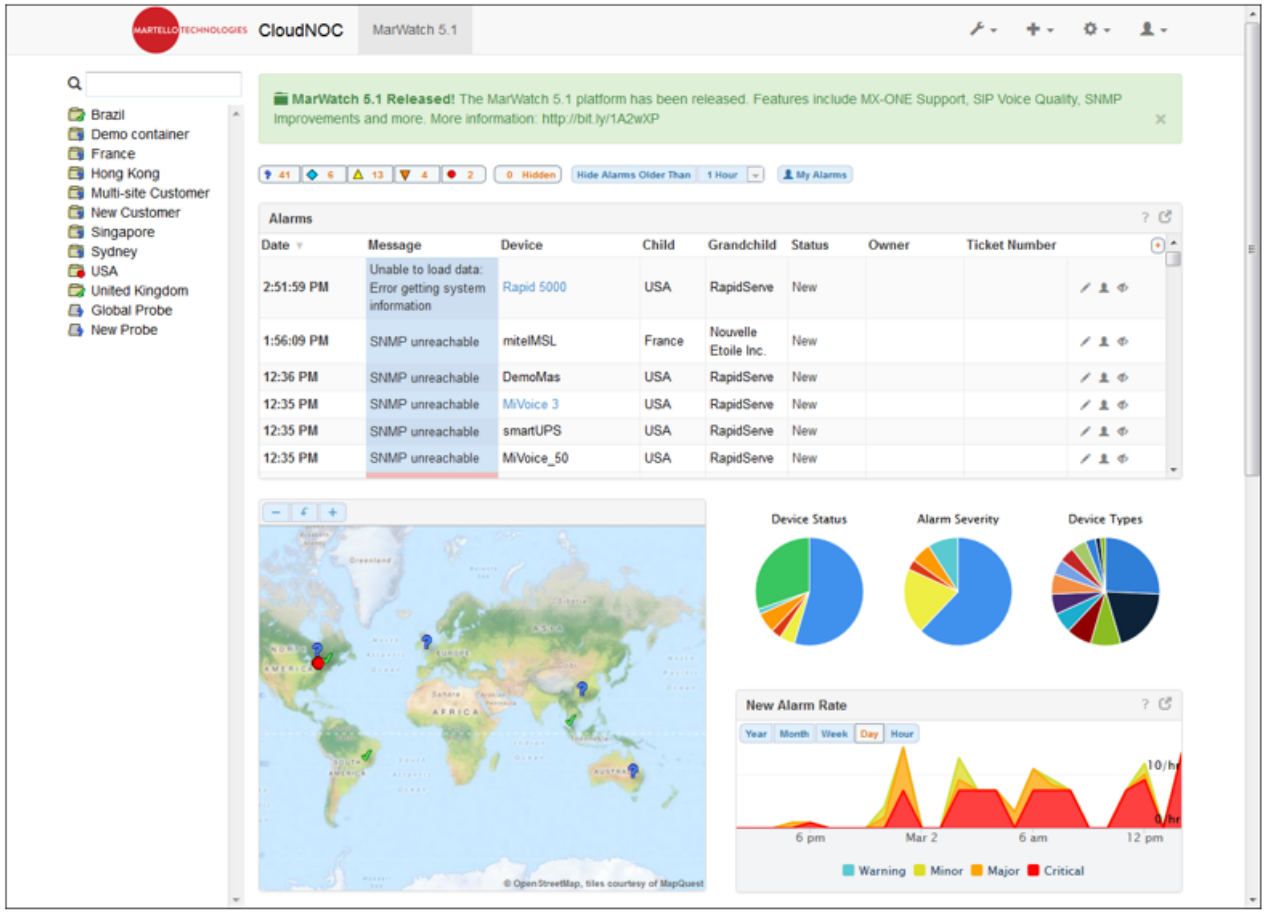
Mitel Performance Analytics supports a wide range of Mitel platforms and third-party networking products. Support for the following Mitel systems is included as part of MiCloud 3.x:

- All variants of MiVoice Business
- MiCollab
- MiVoice Border Gateway
- MiVoice Call Recording
- MiCloud Data Center Infrastructure (switches, routers, and servers).

Components

Mitel Performance Analytics is a server application that works with Probe deployed on the monitored LAN. A sample view of the Marwarch Dashboard is shown in Figure 8 below.

Figure 8: Mitel Performance Analytics Dashboard View



For on-site deployments, the Mitel Performance Analytics server is available as an OVA for a VMware virtual server in three package sizes: small, medium, and large. Consult Mitel

Corporate Sales Engineering to determine the required size for a particular network and architecture.

User access to Mitel Performance Analytics requires a web browser with JavaScript and Adobe Flash supported. Mitel Performance Analytics is expected to work with any standards-compliant browser. See the Mitel Performance Analytics guides for details about tested browsers.

Licensing

Mitel Performance Analytics can be deployed in the cloud or on-premise. For MiCloud service providers, Mitel Performance Analytics is deployed on-premise in the service provider data center. MiCloud includes Mitel Performance Analytics as a component of Oria when a service provider purchases a Premium Software Assurance subscription from Mitel. Mitel Performance Analytics licensing covers devices, capacities, and services. Depending on Mitel Performance Analytics system licensing, every device may require a license, and may support additional optional licensable capabilities.

To activate Mitel Performance Analytics licenses, a Probe must be deployed in the monitored network.

Probe

The Probe enables communication between Mitel Performance Analytics and the customer network. It also acts as a data collector between Mitel Performance Analytics and the monitored devices. The monitored devices send their data to the Probe, which then relays it to Mitel Performance Analytics.

Mitel Performance Analytics provides Probe installers for Windows, Red Hat Linux (and distributions based on Red Hat, such as CentOS and Mitel Standard Linux), as a blade on a Mitel MSL or MiCollab server, or installation as a virtual appliance.

The Probe is designed to be lightweight and to impose minimal host requirements. Host specifications are provided in the Martello guidelines, available on Mitel OnLine. The Probe is also available on a dedicated server appliance, called the Probe Appliance. This is a small form-factor server with pre-installed Probe software. The Probe Appliance uses Debian Linux as its operating system.

To provide monitoring and remote access, the Probe must be able to connect to the LAN devices.

The Probe always initiates IP connections, so firewalls must allow outbound traffic from the monitored network. For details about port requirements refer to Martello guidelines, available on Mitel OnLine.

MiVoice Business Software Installer

The MiVoice Business Software Installer expedites the distribution of software and supports automatically installing and upgrading software on multiple MiVoice Business systems simultaneously. The MiVoice Business Software Installer supports the following capabilities:

- Upgrade or install MiVoice Business software on up to ten controllers simultaneously (up to ten instances of the Software Installer may be launched from the parent window)
- Backup and restore databases
- Specify a location to install Help files for MiVoice Business System Administration Tool
- License a new system and subsequently change License and Option Selection (LOS) information
- Program the system as the Designated License Manager (DLM) for an application group.

The MiVoice Business Software Installer is a stand-alone tool that runs on the Microsoft Windows Operating System, from Windows 2000 to Windows 7. The installer may be run on a computer local or remote to the MiVoice Business system.

Note: For the MXe Server, MiVoice Business for Industry Standard Servers (ISS), MiVoice Business Virtual, and MiVoice Business Multi-Instance, the software installer can only be used for upgrades; full installations are not supported. Full installs and upgrades can also be done using the Scheduler in the System Administration Tool.

Mitel Redirection and Configuration Service

The Mitel Redirection and Configuration Service provides redirection to configuration information and firmware control for Mitel IP phones, facilitating phone deployment for service providers and large geographically distributed enterprises. The Mitel Redirection and Configuration Service provides a plug-and-play provisioning capability for supported phones.

The core feature of Mitel Redirection and Configuration Service is to redirect unconfigured phones to configuration servers that provide configuration information for the phone. It operates, generally speaking, as follows:

- When the phone is plugged in and boots for the first time, the phone attempts to find its configuration server address from, in order of precedence, static programming, DHCP, and factory defaults (Mitel Redirection and Configuration Service).
- For supported phones, the factory defaults include the URL for the Mitel-managed Mitel Redirection and Configuration Service. When using factory defaults, the phone connects to the Mitel Redirection and Configuration Service, obtains the configuration server address, and stores these in static settings.
- For MiNet mode, this server address is stored in the Teleworker Gateway static setting, and the same address is used for the TFTP Server setting, if this setting is not configured statically.
- For SIP mode, this server address is stored in the Provisioning Server static setting. The phone does not contact Mitel Redirection and Configuration Service again unless this setting is deleted by the user or a factory reset is performed. The configuration server is typically

the MiVoice Border Gateway Teleworker gateway used for connection with mobile or external phones.

- For LAN-based phones, the configuration server is the MiVoice Business Call Server, although this would typically be discovered via DHCP rather than contacting Mitel Redirection and Configuration Service.

Mitel Redirection and Configuration Service also supports the capability to provide firmware upgrades. When a phone boots, if it connects to Mitel Redirection and Configuration Service, the phone checks the firmware revision and when required, Mitel Redirection and Configuration Service downloads any firmware specified for the phone's MAC address. Phone firmware may be upgraded or downgraded directly from Mitel Redirection and Configuration Service or from a configuration server, such as the MiVoice Border Gateway or MiVoice Business controller. The precedence order for upgrading firmware is:

- Static programming for TFTP server
- Mitel Redirection and Configuration Service
- DHCP

Note: This precedence differs from the ordering for the configuration server, which is static, DHCP, then Mitel Redirection and Configuration Service.

The Mitel Redirection and Configuration Service server URL is pre-configured in the factory default settings for MiVoice 53xx IP Phones.

See the *Redirection and Configuration Service (RCS) User Guide* for details. This guide is available on Mitel OnLine, on the MiCloud page.

Licensing

Mitel managed Mitel Redirection and Configuration Service is available for Hosted service providers as part of MiCloud Business Solution licensing. There is no additional license fee attached to the service.

Embedded management tools

All Mitel applications provide embedded management tools that support configuration of the features, users and groups for the specific instance of the application. Some of the embedded tools also support management for clustered instances of the same application. This section describes these embedded system managers.

Mitel Standard Linux

Mitel Standard Linux (MSL) server offers two management interfaces. The choice of which to use depends on the activity.

- Server Manager. A web-based control panel for performing tasks such as installing applications, configuring the server and its optional features, and managing available services

- Server Console. A text-based control panel built into the Mitel Standard Linux server and used for performing functions such as changing server configuration, testing Internet access, and managing disk redundancy

The MSL Server Manager is accessed using a standard web browser like Google Chrome, Microsoft Internet Explorer, or Firefox. By default, the server manager is accessible only from the local network. While physically connected to the local network, remote access to the server manager can be configured using the remote management feature or the local networks feature.

The server console provides basic, direct access to the server. Most server console operations are also available from the server manager. Also the server console provides a text-based browser view of the Server Manager, which provides access to the server manager capabilities, although typically not the application-specific panels.

Mitel Standard Linux Server Management capabilities, including added application configuration pages, are typically used only by the server administrator, enterprise, or service provider. There are no management features or access portals for end-customers or end-users.

MiVoice Business Multi-Instance

MiVoice Business Multi-Instance includes several components, each with its own management interface. The components include:

- Mitel Standard Linux. The base operating system on which all other applications reside. This is managed as described above.
- MiVoice Business Multi-Instance Server Manager. Installed as a software blade. It provides an administrative interface for managing the MiVoice Business instances.
- MiVoice Business Media Server Manager. Installed as a software blade. It provides the administrative interface for managing the media servers.
- MiVoice Business Media Servers. One media server is required for each MiVoice Business instance.
- MiVoice Business instances.

MiVoice Business Multi-Instance is not shipped with any MiVoice Business software loads. One or more software loads must be placed into the inventory managed by MiVoice Business Multi-Instance. The inventory contains “master” or “golden” copies of MiVoice Business software loads. The inventory copies are used as the MiVoice Business software image source when creating or upgrading MiVoice Business instances. The software inventory can support multiple versions of MiVoice Business software.

The MiVoice Business Media Server provides Music On Hold, Group Page, Conference Calling and embedded voice mail for the corresponding MiVoice Business instance. A media server instance is required for each MiVoice Business instance. Media Server instances on a single Media Server may connect to MiVoice Business instances on different MiVoice Business Multi-Instance servers.

The MiVoice Business Media Server must be installed on a separate server with no other software co-located, so the minimum deployment for MiVoice Business Multi-Instance is two

servers. Further details about capacity limits are described in the *MiVoice Business Multi-Instance Engineering Guidelines*.

One important consideration when deploying MiVoice Business Multi-Instance is the required IP address allocation. MiVoice Business Multi-Instance provides two addressing modes, Non-VLAN mode and VLAN mode.

For hosted deployments, MiVoice Business Multi-Instance Server supports customer self-management at the customer premises with a restricted System Administration Tool interface within the MiVoice Business Embedded System Management (ESM) tools. This interface permits simple configuration changes such as user moves/adds/changes. For service provider deployments, Oria Customer Administrator portal offers similar customer self-management options.

See the *MiVoice Business Multi Instance Deployment Guide* for management and networking details, and for detailed descriptions of VLAN and Non-VLAN modes.

MiVoice Business

The principal components used for managing MiVoice Business consists of three tools adapted for different users:

- System Administration Tool. Used by technicians to program the system
- Group Administration Tool. Used by administrators to make changes to selected system parameters and user and group information
- Desktop Tool.Used by IP display phone users to program their phones.

The System Administration Tool, Group Administration Tool, and Desktop Tool are web-based tools accessed with a web browser. Supported browsers include Internet Explorer and Mozilla Firefox.

MiVoice Business includes several other management tools designed for specific applications, such as the Line Measure Tool and IP Phone Analyzer, for example.

MiVoice Business also includes capabilities to simplify management and provisioning, including:

- System Data Synchronization. data sharing technology that allows a network of MiVoice Business to share system and user data with other MiVoice Business controllers, MiCollab, and Open Integration Gateway, for example.
- Integrated Directory Services (IDS) Integration. Lightweight Directory Access Protocol (LDAP) interface to support user provisioning with Microsoft Active Directory. Each MiVoice Business system that has a Microsoft Active Directory connection point requires an MiVoice Business IDS License.

MiVoice Business embedded tools provide capabilities for managing multi-node networks, typically up to 20 nodes. For service providers, Oria provides consolidated management capabilities.

System Administration Tool

The System Administration Tool is a web-based interface that enables trained technicians and system administrators to program system-wide settings, voice settings (lines, extensions, management parameters, system directories, and voice mail) and IP network features.

For detailed descriptions and instructions for programming and maintaining MiVoice Business controllers using the System Administration Tool, see the System Administration Tool help, available on Mitel OnLine.

System Data Synchronization

The System Data Synchronization (SDS) capability is a data-sharing technology that allows a network of MiVoice Business systems and an attached MiCollab to automatically share system and user data, reducing the time to provision and manage changes for multiple MiVoice Business network elements.

For detailed information about SDS, and how to start and maintain SDS sharing, see the *Using System Data Synchronization Solutions Guide* on Mitel OnLine.

MiCollab

MiCollab offers a web-based administrator portal for managing MiCollab services and its embedded applications. MiCollab also adds MiCollab-specific panels to the Mitel Standard Linux Server Manager for use in displaying MiCollab information.

Selected management capabilities include:

- MiCollab Configuration panels. Allows managing MiCollab system options such as: welcome e-mails, logs, setting networking information such as e-mail configurations and SNMP support.
- Users and Services panel. Provides tabs for managing users, templates, roles, network elements as well as managing bulk provisioning
- MiCollab Administrator Portal. Additional application panels:
    - MiCollab Client Deployment. Used for setting up the MiCollab for Mobile phone client deployment
    - Vidyo. Used for setting up Vidyo with MiCollab Client
- MiCollab Unified Messaging Web panel. Links to the MiCollab Unified Messaging administrative interface for configuring MiCollab Unified Messaging
- MiCollab Client. Allows configuring MiCollab Client server, checking status, managing client software, and running diagnostics
- MiCollab Audio, Web, and Video Conferencing. Links to the MiCollab Audio, Web, and Video Conferencing administrative page with the ability to manage the server, including configuring ports and setting system options, and monitoring and reporting services
- MiVoice Border Gateway. Allows configuring supported MiVoice Border Gateway services such as Secure Recording Connector, Teleworker and SIP trunking

For the embedded applications, the application management panels are similar to those offered by the stand-alone applications. The MiCollab administrator portal offers a single user interface for entering configuration and administrative settings for all the applications. Common data elements are shared among the applications, reducing the need for duplicate entries. and reducing the possibility of errors.

Inside MiCollab, Suite Application Services (SAS) offers several capabilities to facilitate suite management including:

- MiCollab Administrator portal. Manages the MiCollab system resource panels within Mitel Standard Linux Server Manager, described above
- User and Services Provisioning (USP). Tool used to provision users and their services
- Flow Through Provisioning. MiCollab is included in the SDS network to automatically share data with clustered MiVoice Business instances.
- My Unified Communications portal. User-facing portal for use in updating user-configurable information, described below
- Management API. Management services using a Thrift interface.

These capabilities are described in detail in the MiCollab documentation available on Mitel OnLine.

MiVoice Border Gateway

MiVoice Border Gateway management is performed through the Mitel Standard Linux Server Manager. MiVoice Border Gateway management capabilities include:

- Dashboard and Metrics. Provides system, status, license information, and metrics such as calls per hour and active calls. The dashboard also allows enabling and disabling the application
- Configurations. Allows editing system parameters, setting the network profile, setting up the interacting nodes, and setting alarm thresholds
- Services. Allows adding and editing MiNet and SIP devices that connect to the server, configuring SIP trunk details and status of call recording equipment and taps
- Applications. Supports configuring MiNet and SIP connections as well as application connections
- Clustering. Supports configuring resiliency, load balancing, clusters and zones.

MiVoice Border Gateway supports the Web Services framework. MiVoice Border Gateway provides a Representational state transfer (REST) API that enables management integration through the Oria Provisioning Portal. This feature is configured in Mitel Standard Linux Server Manager.

MiVoice Border Gateway Remote Proxy Services

MiVoice Border Gateway provides remote proxy services to offer a secure interface between applications on the LAN and remote clients. Several components may be configured to support administrative interfaces.

The web proxy component may be used for secure access to both end-user and administrative interfaces of supported applications, including MiVoice Business, MiCollab, Mitel Open Integration Gateway and generic Mitel Standard Linux. Administrative access may be enabled or disabled; when enabled, administrative access may be restricted to one or more specific network addresses.

The remote management component provides administrative-level access control with password authentication. Currently supported permissions include administrative access to the MiVoice Business and MiCollab management web interfaces. User name and password are required to authenticate access via the MiVoice Border Gateway, in addition to authentication required by the application.

Remote Proxy services also provide a password protected FTP server for MiVoice Business software loads and backup files.

Remote Proxy services are included in the MiVoice Border Gateway base application license; no additional license is required.

Mitel Open Integration Gateway

Mitel Open Integration Gateway (OIG) management is performed using the Mitel Standard Linux Server Manager.

Complete Mitel OIG documentation, from installation to programming, is available on Mitel OnLine.

MiCloud CRM Integrations

MiCloud CRM Integrations is managed using the dedicated MiCloud CRM Integrations Portal. Using the Portal, you can:

- Add and set up new Partners and Resellers, and give them privileges to create and administer Customers
- Add and set up new Customers, including making the connection from MiVoice Business to their company CRM
- Manage phone monitors
- Add and manage Users, including hunt and ring groups
- Create teams of users (requires Premium licensing)
- Set Customer hours of operation, time zone, and call duration thresholds, etc.

IP Phones

All MiVoice 53xx IP Phones include embedded management capabilities, accessible through the phone user interface. The management interface allows reviewing and changing network configuration, adjusting phone parameters, and running diagnostic tests.

Typically, phones are assigned addresses using DHCP. DHCP options include configuration information for the related MiVoice Business address, default gateway, and QoS settings. Configuring options in the DHCP server is typically preferred to configuring individual phones.

The phone management capabilities are particularly useful for troubleshooting phone connectivity and audio quality issues.

Architecture-specific considerations

Managing the UC solution has many similarities across all architectures. Considering a broad view of management tasks:

- System configuration. This is typically undertaken by a system administrator.
  - Mitel Standard Linux Server Manager is used to set up networking, server parameters, and remote access. It is also used to manage installation and update of the application software.
  - Embedded management tools, such as MiVoice Business System Administration Tool and MiCollab administrator portal, are used to configure the system parameters.
- User and service configuration. Undertaken by an enterprise group administrator or service provider administrator
  - For Enterprises, MiCollab USP within MiCollab administrator portal is used to define re-usable roles and templates.
  - For service providers, Oria is used to define service bundles including roles and templates.
- User and service provisioning. This is typically undertaken by the end-customer administrator. The Oria customer administrator portal is used to add, update and delete users. Oria also provides capabilities for bulk import. Oria manages updating user data in the related UC systems.
- User administration. This is typically undertaken by end-users. Oria End-User Portal allows users to manage their settings. Oria manages updates of the related UC systems.
- Technical Support. This is typically undertaken by technical staff and IT support staff.
  - Most embedded management tools include support for alarm monitoring, log viewing, and diagnostics.
  - Mitel Performance Analytics and other third-party tools are available for network and server troubleshooting. Consult Mitel Technical Training and/or Mitel Professional Services for recommendations on third-party diagnostic tools.
- Customer Support. This is typically undertaken by technical and customer support staff. Administrator portal allows access to group and user settings; embedded management tools are also used to adjust system wide settings.

Oria automates much of the provisioning process and allows re-use of configuration parameters across multiple customers. Oria is a required component for MiCloud Business Solution deployments, and provides a consolidated view of the network and systems.

For all architectures, Mitel Performance Analytics is recommended for improved fault and performance management. Smaller enterprises may prefer to take advantage of Mitel's managed service, Remote Monitoring and Access Service. Larger enterprises and service providers typically choose Mitel Performance Analytics.

Further details about the management capabilities are available in the MiCloud Deployment Guides, product-specific installation and maintenance guides, and on-line help.

Billing considerations

The following sections describe considerations for setting up and managing billing for the various architectures described in this guide.

Service Providers can now use simplified billing generation and reporting, including the following capabilities:

- Automatically report on all chargeable items for the purpose of reporting back to Mitel on what has been consumed.
- Automatically create a report that can be used by the service provider's billing system to bill end-customers. The report can now be broken down by end-customer and by end-customer site, for customers that have multiple sites.
- Generate reports automatically on a scheduled basis, or ad-hoc. Report scheduling frequency can be daily, weekly (on specific day), or monthly.
- Automatically track Teleworker (a-la-carte add-on) IPT/UC elements that are manually entered.

MiCloud Multi-Instance billing

End-customers are not billed for calls they make inside the business (internal extension-to-extension calls) even though the service provider may be located geographically distant from the customer.

Calls from the customer to the public (external calls) are made through the SIP trunks of the SIP service provider. Charges may be applied to these connections, depending on the service provider capabilities and pricing structure.

Calls that terminate or originate on an EHDU device are treated as internal extensions, but rely on the external trunk and cell-phone access connections. Charges may apply to these calls, since these are carried over a different service provider connection, even for calls to other internal extensions.

Calls between hosted customers are made only via the SIP trunk service provider, with appropriate billing applied. Customer-to-customer calls are considered to be external calls because the connection is made through the SIP provider.

All billing in this architecture is based on information provided from the SIP trunk service provider to the hosted service provider. The hosted service provider decides how to charge the end-customer. For example, billing might be done using a flat monthly fee or it might be based on certain usage patterns, and it will be set up between the hosted service provider and the end-customer.

End-customers are provided with unique DID/DDI numbers. The DID/DDI numbers may be assigned locally, regionally, or represent their calling patterns. For example, a company in the Central United States may have two sets of DID/DDI numbers for calls originating from the east and west portions of the country, even though they are not physically located in either one.

Having DID/DDI numbers in the region that corresponds to the client base helps to reduce tariff charges and presents a local number for callers to dial.

MiCloud Virtual (SMB) billing

Outgoing calls from the customer to the public are made through the SIP trunks of the SIP service provider. Charges may be applied to these connections depending upon the service provider capabilities and charges that they apply.

Calls that terminate or originate on an EHDU device are treated as internal extensions, but rely on the external trunk and cell-phone access connections. Charges may apply to these calls, since these are carried over a different service provider connection, even for calls to other internal extensions.

End-customers are provided with unique DID/DDI numbers. The DID/DDI numbers may be assigned locally, regionally, or represent their calling patterns. For example, a company in the Central United States may have two sets of DID/DDI numbers for calls originating from the east and west portions of the country, even though they are not physically located in either one. Having DID/DDI numbers in the region that corresponds to the client base helps to reduce tariff charges and presents a local number for callers to dial.

SMB-LD billing

The SMB-LD architecture has a simple billing model. Charges for voice services and long distance are provided by the SIP trunk service provider. The service provider breaks out the charges, as appropriate to the end-customers. Charges are based on the end-user DDI/DID number and business DDI/DID number.

Internal calls within a customer are not charged. Connections between customers are only permitted via the SIP trunk service provider and charged accordingly.

MiCloud Business Virtual (MLB and Scalable) billing

Outgoing calls from the customer to the public are made through the SIP trunks of the SIP service provider. Charges may be applied to these connections depending upon the service provider capabilities and their billing model.

Calls that terminate or originate on an EHDU device are treated as internal extensions, but rely on the external trunk and cell-phone access connections. Charges may apply to these calls, since these are carried over a different service provider connection, even for calls to other internal extensions.

End-customers are provided with unique DID/DDI numbers. The DID/DDI numbers may be assigned locally, regionally, or represent their calling patterns. For example, a company may have two sets of DID/DDI numbers for calls originating from the east and west portions of the country, even though they are not physically located in either one. Having DID/DDI numbers in the region that corresponds to the client base helps to reduce tariff charges and presents a local number for callers to dial.

Chapter 7

LICENSING CONSIDERATIONS

Licensing considerations

This chapter includes overviews of two types of licensing:

- Licensing for UCC deployments with Public Cloud, Private Cloud, and Enterprise solutions.
- Licensing of UCC deployments using the UCC v4 licensing constructs in AMC. Further details of the UCC v4 licensing can be found in the *MiCloud Business Solution for Service Providers Licensing Guide*. The guide can be obtained from your local Mitel sales representative.

This section includes information about:

For details, see the *MiCloud Business Solution for Service Providers Licensing Guide*, and the *Mitel Managed Service Provider AMC Licensing Best Practices*, and the *MiCollab Ordering Guide*.

Glossary of licensing terms

Table 19 describes some of the licensing terms and descriptions that are used in this section and when deploying and configuring licenses in the solution:

Table 19: License terms

LICENSE TERM	DESCRIPTION
AMC	Application Management Center: The on-line license center where product licenses are obtained and held within Application Records at the AMC data center. These records are accessed remotely by applications to determine the permitted user operations and features.
ARID	Application Record Identification: A record identifier that allows Mitel applications and products to obtain licenses from the AMC, and refers to a unique product instance that has been deployed.
Device	This is a specific end device or phone the user will use. This could be a dedicated desk phone, a PC softphone, a mobile client, or a reachable number such as a home phone. Devices are associated with user licenses.
DLM	Designated License Manager: A single MiVoice Business that is identified as the recipient of the license information identified by the GARID (see GARID, below). This unit shares licenses and license bundles with other MiVoice Business controllers within the same cluster. The DLM requires a Group Application Record ID (GARID) with Enterprise License Sharing enabled.

Table 19: License terms

LICENSE TERM	DESCRIPTION
GARID	Group Application Record Identification: The GARID allows a number of ARIDs to be grouped together under a common Group ID where the product instances are clustered and can share data. In the case of an MiVoice Business cluster, one MiVoice Business is designated as the DLM and assigned the GARID number. It then shares data with other MiVoice Business controllers in the cluster. A MiVoice Business Express cannot be a DLM. A GARID is also applied to a ULM, but is a construct number, rather than a product assignable number.
IPT	IP Telephony: IP phone service without attached applications or UC support.
MDUG	Multi-Device User Group: A grouping of devices that can be made to ring when the user is contacted. The MDUG used the single MDUL floating license across all devices. When one device in the group becomes busy, all devices are marked busy. A second incoming call goes directly to voice mail, if available, rather than ringing other group phones. Up to eight members are allowed in a group. Some deployments may restrict this to fewer devices.
MDUL	Multi-Device User License: The floating license that is used to activate a Multi-Device User Group (MDUG) within Call Control.
SWAS	Software Assurance and Support: The SWAS license allows access to the technical support teams and documentation, plus downloads of latest software releases and patches. Two levels of support are provided, Standard and Premium.
UC	Unified Communications: A general term used to identify a combination of communication technologies used by users to reach each other. It includes real-time communication including chat, presence, telephony, Video and Speech Recognition, and messaging services such as voice mail, e-mail, and SMS.
UCC	Unified Communications and Collaboration: UC with increased emphasis on collaboration tools, including white-board and file sharing, plus integration with third-party products such as social media, Google, and Salesforce.
ULM	UCC License Manager: A grouping of applications and products that work together to provide the users with a UC experience. The ULM simplifies the licensing of many parts with a single blanket license for a number of underlying services. Rules around use and content of a ULM are covered in later sections.
User	End-user of UC and phone equipment. A User may be assigned multiple phone devices to provide wider UC access. A UC user has a single prime contact number, typically associated with multiple devices. A non-UC user is typically associated with only a single device.

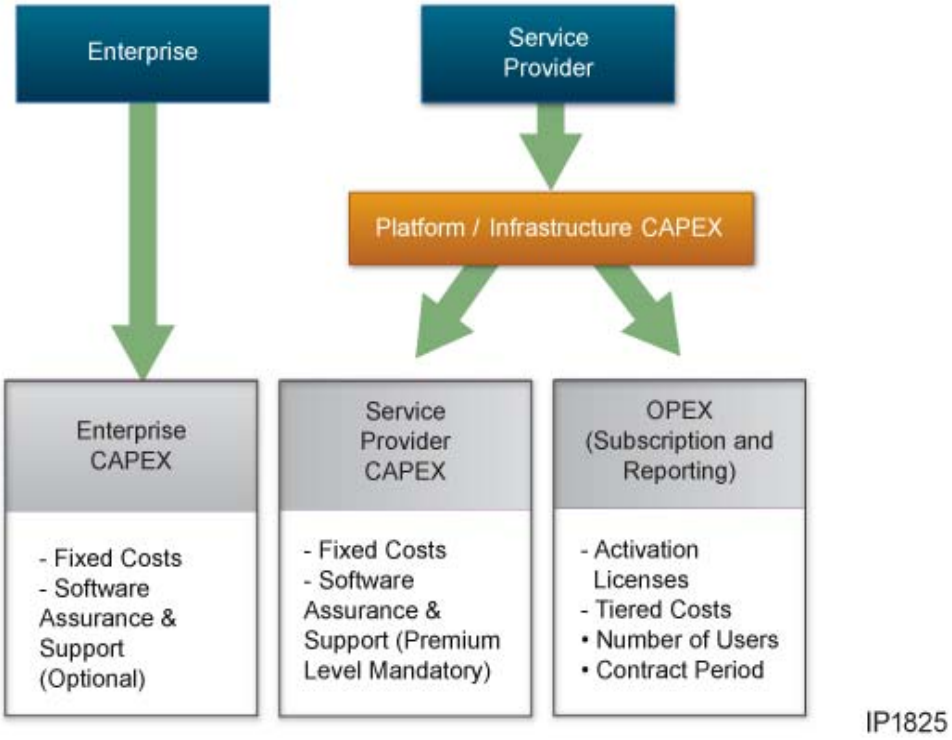
CAPEX and OPEX licensing models

There are two pricing and licensing models that can apply to MiCloud service providers and one model for Enterprise UC. The licensing falls into either the CAPEX (Capital expenditure) or the OPEX (Operational Expenditure) models for the service providers. On-Premise, or Private Cloud Enterprise UC users follow a separate CAPEX only model. The different models are shown in the graphic below. For Enterprise/On-Premise deployments and service providers following the CAPEX model, Software assurance is a separately licensed item. Service providers following the CAPEX model must purchase the premium level of Software Assurance.

For service providers following the OPEX model, Software Assurance is included with the monthly subscription.

Service providers must follow the Service Provider Licensing Model, which includes certain qualification agreements and specific sales targets. Details about the terms and conditions for service providers can be found in the Managed Service Provider Addendum to the Mitel Authorized Partner Agreement. Further license details are found in the *MiCloud Business Solution for Service Providers Licensing Guide*, available from a local Mitel Sales Representative.

Figure 9: Licensing Models



End-User UCC licensing profiles

There are a number of pre-bundled user profiles that are used for UCC deployments.

For the up-to-date list of licensing User Profiles, along with their Base and Additional functions, see the *MiCollab Ordering Guide*.

All of the UC-based user profiles that are bundled as license packages are contained under a single part number.

For on-premise deployments, the Standard IPT licensing can be associated with a MiCollab Unified Messaging, if available, rather than Embedded Voice Mail.

For on-premise deployments with UCC, the Basic IPT is replaced with the Basic UCC profile.

The Entry UCC profile is split into two distinct user profiles: Entry SB UCC and Entry UCC. The appropriate profile to use is based on deployment architecture, as shown below:

- Use the Entry SB UCC User profile for all deployments without MiCollab.
- Use the Entry SB UCC User profile for a MiCloud Business deployment, with MiCloud Business SB architecture using MiVoice Business Multi-Instance, with MiCollab Client Multi-Tenant.
- Use the Entry UCC User profile when deployed with a full UCC-capable MiCollab.

Additional UCC license details can also be found in the *MiCollab Installation and Maintenance Guide*.

The Oria management application can identify the underlying infrastructure and program the appropriate Entry UC profile. Table 20 highlights how the different user profiles are applied to different architectures:

Table 20: User profiles and architectures

USER PROFILE	MICLOUD BUSINESS SB (MIVOICE BUSINESS MULTI-INSTANCE WITH MICOLLAB MT)	MICLOUD BUSINESS SMB-LD (MIVOICE BUSINESS MULTI-INSTANCE W/O MICOLLAB)	MICLOUD BUSINESS SMB-LD (MIVOICE BUSINESS MULTI-INSTANCE WITH MICOLLAB)	ENTERPRISE UC AND MICLOUD BUSINESS WITH MICOLLAB (ST)
Basic IPT	Available	Available	Available	Available
Standard IPT	Available	Available	Available	Available
Entry SB UCC	Available	Available	NA	NA
Entry UCC	NA	NA	Available	Available
Standard UCC	NA	NA	Available	Available
Premium UCC	NA	NA	Available	Available

Notes:

- MT = Multi-Tenant
- ST = Single-tenant

The User Profile options that are available depend upon whether MiCollab UC capability is present, and the level of UC capability, such as with full UCC with a per-customer MiCollab, or UC capability with a MiCollab Client Multi-Tenant configuration.

The per-customer MiCollab deployments use the integrated UM-based voice mail. The MiCollab Client Multi-Tenant, or lack of MiCollab require either an external voice mail, or use of the embedded voice mail delivered in the MiVoice Business instance or controller.

The Entry SB UCC Profile is limited to two devices, whereas the Entry UCC, Standard, and Premium UCC profiles allow a maximum of eight devices to be associated with a user. For practical purposes, the usual number of devices is not expected to exceed four.

Note: A combination such as EHDU and Mobile softphone represents two devices, and two different call paths to the call control, even if they are both deployed on the same physical smart phone.

Overview of AMC: How UCC licenses are organized

The AMC is a common license repository for customer configuration and deployments. The AMC maintains records of purchased and configured licenses against each specific Customer ID. Within this Customer ID record, specific products are assigned licenses against unique Application Records IDs (ARIDs). The ARIDs are then loaded onto the products, which use this information to remotely access the AMC and cross-verify the licenses.

Using the AMC allows any changes to be quickly applied and for the product platforms to pick up changes automatically. The AMC also allows licenses to be moved within a customer ID record, for example with adds, moves, and changes.

User licenses are grouped and distributed inside the UCC License Manager (ULM) and Designated License Manager (DLM) constructs. A ULM is required for use of UCC licenses. Use of a DLM is recommended as a single point of user license distribution in a defined cluster of MiVoice Business platforms.

Licenses from one customer can be moved to another customer, to the same platform type and within the same Customer ID record. Licenses cannot be moved between Customer ID records. For this reason, the definition and use of a customer ID is important.

There may be multiple end-customers, but only one product or service deployment customer. In this case the Customer ID is assigned to the service provider. Licenses can be moved between end-customers, as needed, within the same service provider Customer ID record. Service providers must be qualified by Mitel before using the service provider license model.

For service providers using the OPEX model, there are two important license types to consider: activation licenses and monthly subscription licenses. Typically, activation licenses carry minimal cost and allow the infrastructure to be put into place ahead of end-customer roll-out. As end-customers come on-board, services are assigned to each user using Oria. Each month, the service provider reports back to Mitel about which licenses are being consumed from the monthly subscription licenses.

The licenses are constructed in AMC in hierarchical fashion, starting with the Customer ID record and going down to the level of an individual product and users. The following is an example of the hierarchy that might be encountered under a Customer ID record.

Figure 10: UCC Licensing example

CUSTOMER ID RECORD	NETWORK ELEMENT TYPE
MiVB 1	MiVoice Business
MiVBG 1	MiVoice Border Gateway
ULM 1	

CUSTOMER ID RECORD	NETWORK ELEMENT TYPE
MiCollab 1	MiCollab
MiVBG 2	MiVoice Border Gateway
OIG 1	Open Integration Gateway
GARID 1	
MiVB (and **DLM**) 2	MiVoice Business
MiVB 3	MiVoice Business
MiVB 4	MiVoice Business

Table 21 describes this hierarchy.

Table 21: License hierarchy

LICENSED DEVICE	DESCRIPTION	ADDITIONAL NOTES AND USAGE
MiVB 1 (MiVoice Business)	MiVB 1 is common to all end-customers, or is a unique unit not associated with a ULM.	Licenses are manually provisioned. Usage Example: Common SIP or PRI trunk routing
MiVBG 1 (MiVoice Border Gateway)	MiVBG 1 is common to all end-customers, or is a unique unit not associated with a ULM.	Licenses are manually provisioned. Usage Example: Common SIP Trunk gateway to SIP Trunk SP
ULM 1	ULM 1 is a Group ARID to identify a unified solution grouping. The ULM GARID number is not applied directly to an end device or application,	This is a grouping construct, but not used directly on any applications. See additional notes below table. Usage Example: Needed to include MiCollab and pool UCC licenses
MiCollab 1	MiCollab 1 is the unified communications application package.	The MiCollab includes a MiVoice Border Gateway, which must be clustered to any other MiVoice Border Gateways in the ULM in order to share licenses. MiCollab does not share licenses with MiVoice Business and the DLM, but is aware of the allocation. Usage Example: UCC deployment
OIG 1	Mitel Open Integration Gateway 1 provides application attachment to MiVoice Business and allows external CRM connections.	Open Integration Gateway licenses are manually provisioned. Usage Example: Used to provide MiVoice Integrated connections to external third-party suppliers such as Google and Salesforce,
MiVB 2 (and DLM)	MiVB 2 is grouped under the ULM and linked to the MiCollab 1. This unit is also the DLM for a wider number of MiVoice Business controllers.	Example: The DLM allows license sharing between MiVoice Business controllers within the same MiVoice Business cluster. This is to allow Single Point User Provisioning from the MiCollab 1 unit.
MiVB 3	MiVB 3 is a MiVoice Business unit linked to the MiVB 2 DLM unit.	Example: A resilient MiVoice Business controller for MiVB 2, or an additional unit for more users and devices

Additional restrictions apply to the number of MiCollab and MiVoice Business units that can be in the same ULM. This may result in MiVoice Business being configured outside of the ULM, and linked back using a common DLM, or treated as a separate unit.

Follow these rules to minimize such configuration exceptions.

The ULM can contain the following units and configurations:

- Allowance for multiple MiCollab instances, but only a single DLM or MiVoice Business
- Allowance for a single MiCollab and multiple DLMs or MiVoice Business instances
- Allowance for multiple MiVoice Border Gateway instances. These may be clustered back to the MiCollab for license sharing, or treated as standalone units or clusters. MiVoice Border Gateway cluster limits may apply.
- Allowance for multiple Mitel Open Integration Gateway instances (manually provisioned)
- A ULM cannot contain multiple MiCollab AND (multiple DLMs OR multiple MiVoice Business instances).

Some specific platform caveats also apply:

- MiVoice Business Express cannot become a DLM and only one MiVoice Business in MiVoice Business Express is allowed in the ULM.
- If you have MiVoice Business Express with an external MiVoice Business for resiliency, the external/secondary MiVoice Business must act as the DLM.
- MiCollab Client Multi-Tenant is considered a single MiCollab unit, even though many customers may connect through it. Multiple DLMs and MiVoice Business instances for different customers are allowed.

Creation of DLM and ULM in the AMC

The DLM and ULM constructs allow a number of products to be grouped under a common Group ARID (GARID). Although these are used as a top-down grouping, they are created using a bottom-up approach. See the previous section “Overview of AMC: How UCC licenses are organized” on page 147 for an example of GARID groupings.

ULM and DLM creation are both associated with a MiVoice Business. After an initial MiVoice Business ARID has been created, you have additional options to create a DLM and ULM. While a ULM has to be created against a MiVoice Business, it is primarily associated with the MiCollab licenses.

It is different for the MiVoice Business Express, which is an preset grouping of components. The MiVoice Business Express allows the creation of a ULM, but does not allow the creation of a DLM.

The DLM is a grouping of ARIDs under a common GARID. This GARID must be associated with a MiVoice Business, and must be programmed into the Designated License Manager unit.

The ULM is a grouping construct. It is used to group ARIDs under a common GARID, but is not programmed into any particular unit. However, by convention, a ULM is logically associated with a MiCollab unit, or group of units. A ULM contains both MiVoice Business and MiCollab; either:

- Multiple MiVoice Business and ONE MiCollab, or
- Multiple MiCollab and ONE MiVoice Business.

A ULM is required for use of UCC licensing. A DLM is recommended to provide a single point of distribution of user licenses within a defined cluster of MiVoice Business platforms.

For service provider deployments that are voice-centric, the use of a ULM is required. This ensures consistency of deployment. It also simplifies deployment if UC or UCC functionality is added at a later date.

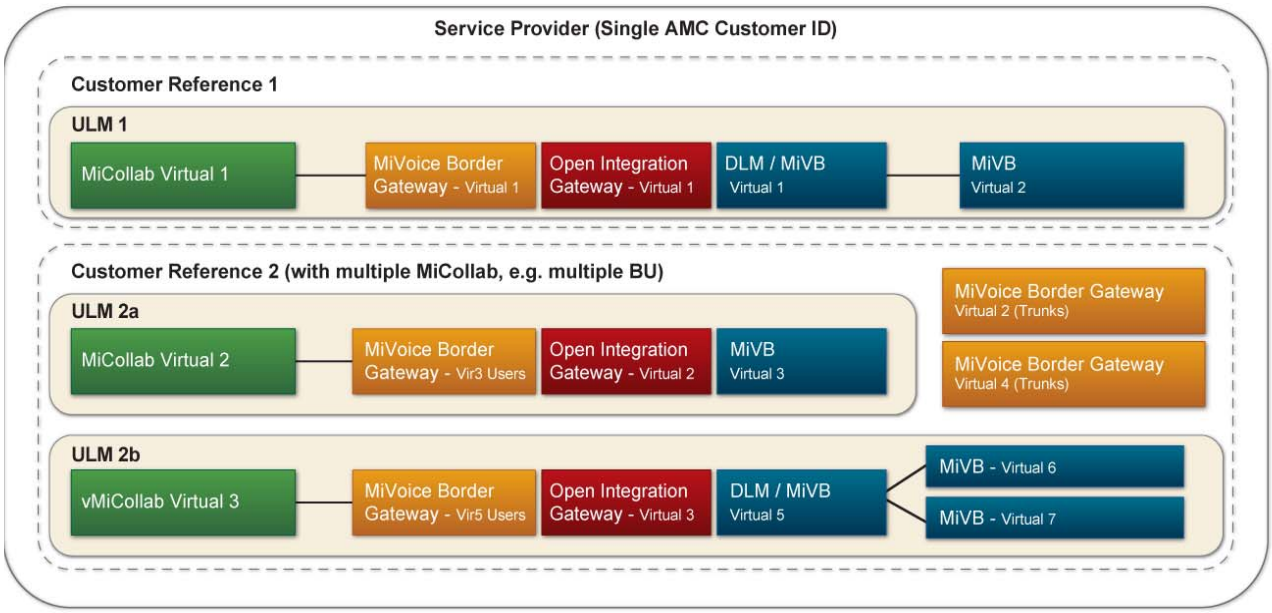
Sample configurations for the different architectures

Most of the architectures that are covered in this Blueprint document can be described in a simple standard AMC license structure. There are some variations on the standard license structure for the MiCloud Business Small Business and MiVoice Business Express architectures, and these are described in later sections.

Standard UCC AMC hierarchy and license structure

Figure 11 shows two examples of a license hierarchy and structure for a service provider with multiple end-customers with segregated deployments; that is, the MiCollab, MiVoice Border Gateway, and MiVoice Business are deployed per-customer. This is the structure for on-premise, private cloud, and service providers in which customers are assigned their own instances, or their own private network.

Figure 11: Service provider license hierarchy for multiple end-customers



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In the graphic, the Customer ID is associated with the service provider.

For an on-premise or private cloud deployment the Customer ID is associated with the end-customer, not the service provider.

In the graphic, two customer references are highlighted, bounded by dashed lines. The Customer Reference designations do not exist in the AMC, but are used in the graphic to highlight the logical boundaries between customers. Typically, a service provider would identify which components to associate with each end-customer, and this identifies the customer reference boundary.

Customer Reference 1 is a typical deployment. The ULM is centered around a single MiCollab. The customer requires an additional MiVoice Border Gateway for trunks and Teleworker and this is clustered with the MiVoice Border Gateway that is associated with MiCollab. This customer also requires a MiVoice Integration application. The customer has two MiVoice Business instances deployed. If these are Primary/Secondary units used to provide resilient operation, the DLM is not needed, but if these are load sharing, or there is more than one MiVoice Business with registered users in the deployment, then a common DLM is required to link these units together. Multiple MiVoice Business instances can be used, but the common DLM simplifies the configuration and on-going management of licenses with moves/adds/changes.

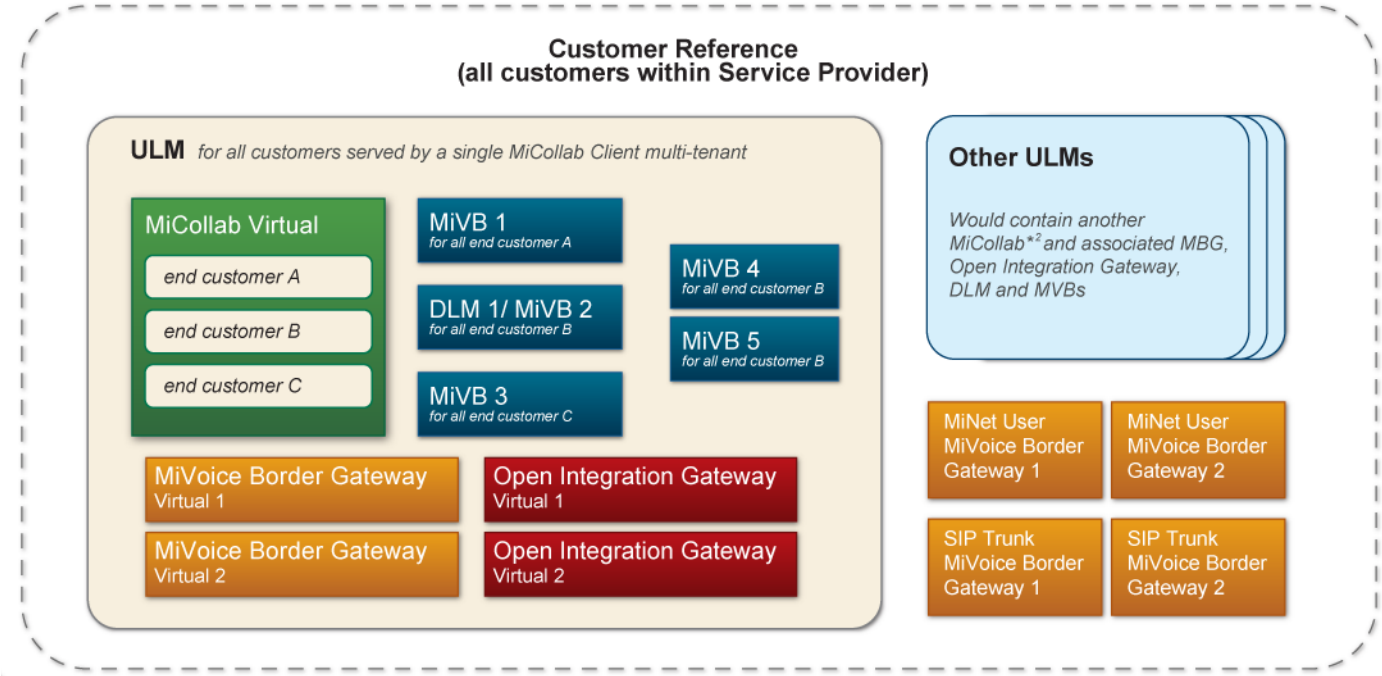
Although the customer reference would typically line up with a ULM boundary, this may not always be the case. In the **Customer Reference 2** graphic, there are multiple ULMs associated with the customer, and also some additional MiVoice Business and MiVoice Border Gateway units that are common to this customer deployment, independent of the ULM configurations.

Customer Reference 2 is a larger deployment. The customer requires two MiCollab units, and these are split into two ULMs. It is possible to have multiple MiCollab instances in a single ULM, but then only one DLM and no MiVoice Business instances would be allowed inside the DLM. Either of the configurations operate correctly, but including the MiVoice Business with the DLM in the ULM makes it easier to manage license sharing and identification of the units associated with a particular customer. The recommendation is to deploy one ULM associated with one MiCollab.

Small Business: UCC AMC hierarchy and license structure

The MiCloud SB architecture uses a common address space to deal with multiple customers, rather than a unique address space per customer. This means that the UC components are more associated with the service provider than with individual customers. The SB architecture uses the MiCollab Client Multi-Tenant, which handles multiple end-customers in a single MiCollab unit.

Figure 12: Service Provider licensing for SB architecture



Although a Customer Reference boundary is shown in Figure 12, this is really associated with the service provider, not the individual end-customers.

If the capacity of the MiCollab Client Multi-Tenant is exceeded and additional MiCollab Client Multi-Tenant servers are needed, then additional ULMs must be created to match, as indicated by “Other ULMs” in the graphic.

The SB architecture includes a number of gateways and portals that are associated with common access into and out of the network. These are for common SIP trunks and common phone access, as Teleworkers. These common components are highlighted as MiVoice Border Gateways 1 and 2 (SIP Trunk and MiNet User) and are independent of any ULM. The licenses for these units are provisioned manually.

ULMs are associated with a single MiCollab Client Multi-Tenant. The shared MiCollab Client Multi-Tenant, at the ULM level, contains all the UCC license requirements across all the tenants. Within this ULM, it is possible to assign multiple MiVoice Business and DLMs to each of the end-customers on the MiCollab. Multiple MiVoice Integration can also be deployed within the ULM for customers that require application attachment.

Licenses for MiVoice Integration must be provisioned manually from within the ULM. The MiVoice Border Gateway units in the ULM are associated with common UCC functions and service access to the MiCollab Client Multi-Tenant, not to individual customers. These MiVoice Border Gateways can be clustered for resiliency and scaling. This may result in multiple MiVoice Border Gateway clusters. The MiVoice Border Gateway clusters are not associated with the single MiVoice Border Gateway that is associated with the MiCollab, and their licenses must be provisioned manually.

The licenses for MiVoice Business and DLM are provisioned manually, and not through MiCollab.

Small Medium Business: UCC AMC hierarchy and license structure

The SMB architecture uses MiVoice Business Express. MiVoice Business Express, installed on VMware, includes a dedicated solution package that contains many of the key functions that are needed to deploy it. Because the key components are all available in a single package, expansion capabilities for the ULM are limited.

Figure 13: Service Provider Licensing for MiVoice Business Express

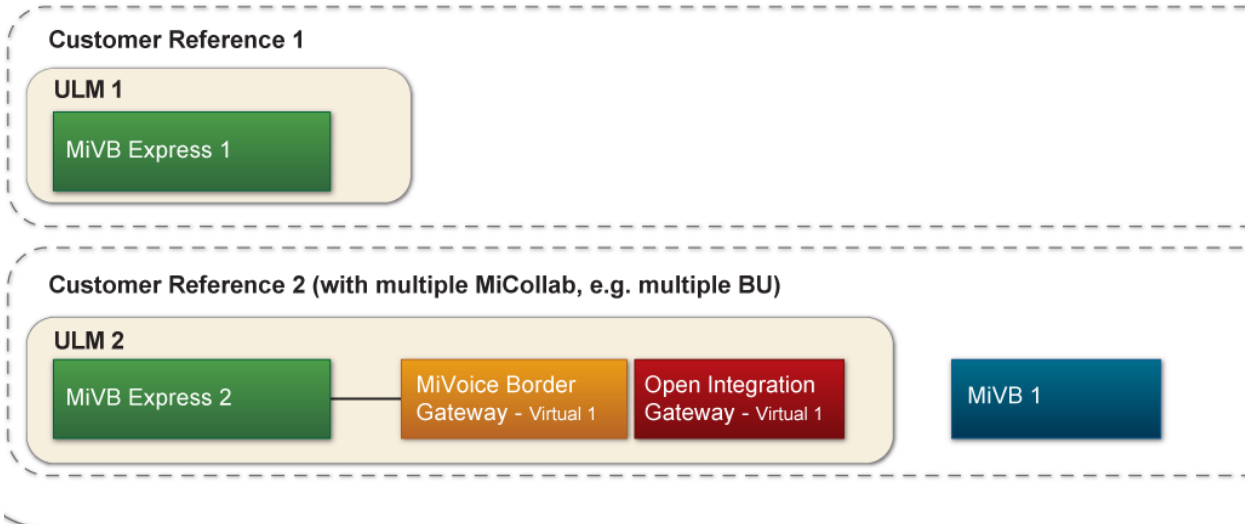


Figure 13 highlights two different customer configurations, each using a separate MiVoice Business Express package. Customer 1 uses the standard deployment, while Customer 2 has some expansion options included.

For Customer Reference 1

This customer has deployed a single MiVoice Business Express virtual package. The call control, UCC capabilities, and external gateways are all contained in this package.

For Customer Reference 2

For this customer, an additional MiVoice Border Gateway has been included. This could be for additional trunks, maybe to an alternative service provider, or for additional Teleworker and UC users. This MiVoice Border Gateway is clustered with the MiVoice Border Gateway that is part of the MiVoice Business Express so that licenses can be shared.

A MiVoice Integration (uses Open Integration Gateway) has been included for additional application attachment. The MiVoice Integration licenses must be provisioned manually.

In Customer Reference 2, there is an additional on-premise MiVoice Business gateway. This can be clustered with the MiVoice Business Virtual in the MiVoice Business Express.

MiVoice Business Express Release 7.1+ supports deployment with a secondary MiVoice Business controller. In this case, the secondary MiVoice Business must act as the DLM. MiVoice Business Express cannot act as a DLM.

Due to added complexity of license management, it is recommended that the on-premise MiVoice Business only provide secondary resiliency for users, or have devices that do not typically change, such as paging units and door openers. This reduces license provisioning and complexity due to possible user moves/adds /changes.

Licensing for enhanced services and overlays

Additional components for enhanced services and overlays have different licensing requirements, as shown in Table 22.

Table 22: Licensing for enhanced services and overlays

COMPONENT TO BE ADDED	LICENSING
MiVoice Border Gateway Secure Recording Connector • for use with MiVoice Call Recording	License through the AMC and include in ULMs (similar to other MiVoice Border Gateways).
Mitel Performance Analytics	License through Mitel Cloud Services,.
MiContact Center	License through the MiContact Center license manager.
Business Reporter	License through the MiContact Center license manager.
MiCloud Business Analytics	License through the MiContact Center license manager.
MiVoice Call Recording	License through the MiContact Center license manager.
MiVoice for Skype for Business	Licenses available as add-on licenses and included in ULMs (similar to other à la carte licenses).
Vidyo	Purchase through Mitel Cloud Services and managed through the Vidyo Portal.

Appendix A

GLOSSARY

Glossary

TERM	DESCRIPTION
ACD	Automatic Call Distribution. A package of advanced call processing features, relating to groups of agents who handle calls and agent supervisors.
AMC	Applications Management Center. Used to activate new hardware and software licenses for Mitel products.
ARID	Application Record ID - License ID created by and for the Mitel AMC.
ARP	ARP – Address Resolution Protocol. Used to identify a MAC address against an IP address.
ARS	ARS – Automatic Route Selection. This is a method whereby call control can best determine the path from one controller to another and provide a seamless connection to the user.
ASU	ASU – Analog Services Unit. This unit provides a combination of analog ONS interfaces for phones and/or LS trunks.
BRI	BRI – Basic Rate Interface. Digital ISDN connection to PSTN or local digital phone. This is the smallest quantity of digital channels that can be delivered, and consists of two digital channels for voice and data. Variants include the U interface for North America and S0 in Europe.
Call Control	Software to create connections and paths between end-user devices.
CAT 3	Category 3 Cable. A type of UTP cable for use in a LAN, capable of 16 Mbps. Typically used for voice and data on 10BASE-T Ethernet.
CAT 5	Category 5 Cable. A type of UTP cable for use in a LAN, capable of 100 Mbps.
CCS	Centum Call Second. A measure of call traffic. One call lasting 100 seconds is referred to as 1 CCS.
CDE	Customer Data Entry. A command line interface used to configure the Mitel 3300 ICP.
CDP	Cisco Discovery Protocol. A Cisco proprietary protocol that allows IP devices and L2 switches to communicate with each other for configuration purposes.
CEID	Cluster Element ID. A means of identifying different system units to maintain a consistent number plan.
CESID	Customer Emergency Services Identifier. A means of correlating a user and a directory number to information stored in a physical location data base.
CIM	Copper Interface Module. A TDM interface module used to connect the ICP to various peripherals via CAT 5 UTP.
CIR	Committed Information Rate. A means to identify how much information MUST be carried in a connection, e.g. CIR = 64 Kbps for voice.
CODEC	COder and DECoder. Coder and decoder commonly used as a single function. A means to convert analog speech into digital PCM and vice versa.
Controller	Control element of ICP (see also RTC).
COS	Class of Service. This refers to the priority value in the Layer 2 part of an IP packet when IEEE 802.1p is used.
CPH	Calls Per Hour. For example, six CPH means six calls per hour.

TERM	DESCRIPTION
CRM	Customer Relationship Manager. An examples supported by MiCloud is Salesforce.com.
CSM	Customer Service Manager. Former name for MiContact Center Office, an entry level contact center solution hosted on MiCollab for basic contact centers or work groups with up to 100 agents.
CSMA/CD	Carrier Sense Multiple Access Collision Detect. The mechanism used on shared Ethernet connections to ensure that devices are not sending at the same time, and if they are, to initiate a back-off and retry algorithm.
CTI	Computer Telephony Integration. Means of combining computer functions to control operation of telephony equipment.
Datagram	A logical grouping of information sent as a network layer unit over a transmission medium without prior establishment of a virtual circuit. IP datagrams are the primary information units in the Internet. The terms “frame”, “message” and “packet” are also used to describe a datagram.
DECT	Digital Enhanced Cordless Telephony. Originally this was a European standard for digital cordless phones. This is now a worldwide standard, hence, the name change to Enhanced. Standard DECT phones are not available in North America.
DHCP	Dynamic Host Configuration Protocol. A means of passing out IP addresses in a controlled manner from a central point/server.
DiffServ	Differentiated Services. DiffServ is a protocol for specifying and controlling network traffic by class so that certain types of traffic get precedence. For example, voice traffic, which requires a relatively uninterrupted flow of data, might get precedence over other kinds of traffic. Differentiated Services is the most advanced method for managing traffic in WAN connections. This uses the Type of Service field at Layer 3 in an IP packet. See also DSCP.
DLM	Distributed License Manager
DN	Directory Number. A telephone or extension number.
DNIC	Digital Network Interface Circuit. A chip used as the basis for several sets which handle both voice and data.
DNS	Domain Name Server. A means of translating between typed names and actual IP addresses, e.g. microsoft.com = 207.46.134.222
DPNSS	Digital Private Network Signalling System. A British common channel signalling protocol for requesting or providing services from/to another PBX.
DSCP	Differentiated Services Code Point. This is a value that is assigned to the Type of Service byte in each outgoing packet. The value can be in the range of 0 to 63 and allows routers at Layer 3 to direct the data to an appropriate queue. Value 46 is recommended for voice and will use the Expedited Forwarding queue or Class of Service.
DSP	Digital Signal Processor. This is a programmable device that can manipulate signals, such as audio, to generate and detect a range of signals, e.g. DTMF signalling.
DSU	Digital Service Unit. A peripheral which provides digital ports for the ICP.
DTMF	Dual Tone Multi-Frequency. In-voice-band tones used by telephones to signal a particular dialed digit. Also known as touch tone.
E	Erlang. A measure of usage of a resource, e.g. 0.75 e = 75%. 1 e = 36 CCS.
E1	Primary Rate running at 2.048 Mbps providing 30 channels of voice of PCM.

TERM	DESCRIPTION
E2T	Ethernet to TDM. This is the conversion of voice streaming between TDM and IP.
E911	Enhanced 911 (Emergency Services). Also 999 (UK) and 112 (International).
eMOH	Embedded Music On Hold.
ESM	Embedded System Management. Means to program a system from the System Administration Tool, Group Administration Tool, or Desktop Tool.
FAX	A means of transmitting printed text or picture information with acoustic tones.
FIM	Fiber Interface Module. A fiber optic TDM interface module used to connect the ICP to various peripherals.
FQDN	Fully Qualified Domain Name. The complete domain name for a specific computer, host, or IP end-point. The FQDN consists of two parts: the host name and the domain name. For example, an FQDN for a hypothetical server might be MyServer.Business.com. The host name is MyServer, and this host is located within the domain called Business.com. A Domain Name Server (DNS) is used to resolve the FQDN to an actual IP address.
FTP	File Transfer Protocol. An electronic method to transfer file information.
G.711	G.711 – PCM Voice Streaming. ITU standard for conversion of voice-streaming to digital PCM (64 kbps).
G.729	Voice Streaming CODEC. Reduced bit rate from G.711 (8 kbit/s)
GARID	Group ARID/Group Application Record ID
Group Controller	The call control of the ICP is in control of a number of units, where the functions are more dedicated, e.g. to a separate gateway
GRP	Gateway Routing Protocol. A generic term which refers to routing protocols.
HSRP	Hot Standby Routing Protocol. A Cisco proprietary protocol used to increase availability of default gateways used by end hosts.
ICMP	Internet Control Message Protocol. Messages to help identify when devices are present and create warnings when they fail.
ICP	IP Communications Platform. Includes gateway function, call control, plus a number of other features, such as voice mail.
IDS	Integrated Directory Services. Integration used to interface MiCollab and MiVoice Business to Microsoft Active Directory.
IP Address	Internet protocol address. A 32-bit address assigned to hosts using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as four octets separated by periods (dotted decimal format). Each address consists of a network number, an optional subnetwork number, and a host number. The network and subnetwork numbers together are used for routing, while the host number is used to address an individual host within the network or subnetwork.
IP	Internet Protocol. An encapsulation protocol that allows data to be passed from one end-user to another. Typically this was over the Internet, but the same protocol is now used within businesses.
IRDP	ICMP Router Discovery Protocol. An extension to the ICMP protocol that provides a method for hosts to discover routers and a method for routers to advertise their existence to hosts.

TERM	DESCRIPTION
ISDN	Integrated Services Digital Network. The digital PSTN network. Integrated because this network carries both voice and data and provides direct digital connectivity to the user via BRI or PRI connections.
ISL	Inter-Switch Link. Cisco-proprietary protocol that maintains VLAN information as traffic flows between switches and routers.
L2	Layer 2. The second layer of encapsulation of data to be transferred. Typically with TCP/IP this includes the MAC layer.
L3	Layer 3. The third layer of encapsulation of data to be transferred. Typically with TCP/IP this includes the IP address.
LAN	Local Area Network. This is a network within a local area, typically within a radius of 100 m. The transmission protocol is typically Ethernet II.
Leased IP	An IP address that has been assigned through DHCP and is valid only for the duration of the agreed lease time.
LLDP	Link Layer Discovery Protocol. A low level protocol used to pass information about the connection configuration between two end devices, for example VLAN. Typically this would be between an end device such as a PC or IP phone and the network access port on the Layer 2 switch.
LLDP-MED	Link Layer Discovery Protocol - Media End-point Discovery. LLDP-MED is an extension of LLDP that provides auto-configuration and exchange of media-related information such as voice VLAN and QoS. It is designed to provide enhanced VoIP deployment and management.
LS	Loop Start – This is a particular analog trunk protocol for signalling incoming and outgoing calls.
MAC	Media Access Controller. This is the hardware interface that data (media) travels through. Typically this will be assigned a world-wide unique address.
MAN	Metropolitan Area Network. This is a larger network that may connect a number of LANs within a business, as well as a number of businesses. Typically, this would cover a city area, and use fibre optics to get maximum bandwidth.
Mbps	MegaBits Per Second. Million bits per second is a measure of bandwidth on a telecommunications medium. May also be written as Mbits/s or Mb/s. Mbps is not to be confused with MBps (megabytes per second).
MDUG	Multi-Device User Group. A licensing construct used for license sharing among devices.
MFRD	Mitel Feature Resources Dimensions. This is a definition of the number of features that can be used on a particular unit.
MHz	Megahertz. Frequency measurement.
MiNet	Mitel Network Protocol. This is Mitel's proprietary stimulus-based protocol that is used to signal between phones and controllers, for example key and display information.
MiTAI	Mitel Telephony Application Interface. This Mitel implementation of TAPI is used to connect to external applications, e.g. ACD controllers.
Mitel OIG	Mitel Open Integration Gateway
MLB	MiCloud Business Solution Medium Large Business architecture

TERM	DESCRIPTION
Modem	MOdulator-DEModulator. Device that converts digital and analog signals. At the source, a modem converts digital signals to a form suitable for transmission over analog communication facilities. At the destination, the analog signals are returned to their digital form. Modems allow data to be transmitted over voice-grade telephone lines.
MOH	Music on Hold
MTBF	Mean Time Between Failures. The statistical time between expected component failures.
MTU	Maximum Transmission Unit. An MTU is the largest size packet or frame, specified in octets (eight-bit bytes), that can be sent in a packet- or frame-based network, such as the Internet.
MWI	Message Waiting Indicator. A visual indicator in a telephone that indicates to the user that a message is waiting.
NAS	Network-attached Storage. A file-level computer data storage server connected to a computer network providing data access to a heterogeneous group of clients.
NAT	Network Address Translation. A means of translating internal IP addresses to a defined limited range of Internet IP addresses. The benefit is the ability to use a limited range of Internet addresses and map these to a much larger internal range.
NIC	Network Interface Card. Physical connection to the network. In a PC, this is often a plug-in card.
NSU	Network Services Unit. This interface connects between the PSTN Primary Rate trunks and the ICP.
On-Premise	UC Enterprise Solution Solution On-Premise architecture
ONS	On-Premise Line. This is a two-wire analog telephony interface, within an office environment, and not passed outside.
OPS	Off-Premise Line. This is a two-wire analog telephony interface, typically installed external to a building, e.g. external shed or guard house.
OSPF	Open Shortest Path First. A link-state routing protocol used for routing IP traffic over the most cost-efficient route.
PC	Personal Computer
PCM	Pulse Code Modulation. The digital representation of analog signals.
PDA	Personal Digital Assistant. A handheld personal organizer that can interface to a PC or a Mitel PDA Phone.
Permanent IP	An IP address that has been leased (from DHCP) on a permanent basis.
PI	Performance Index. A calculation of the performance limits of a system. Different weighting values are assigned to various types of calls. Based on the expected calls per hour (CPH) of all of the user ports on the system, a system performance index (PI) can be calculated. The system PI is used as an indication of how much traffic the MiVoice Business MiVoice Business 3300 ICP can handle at any one time.
Ping	This is a means of sending a test message and waiting for a reply to determine if a network device is reachable. On a PC, this is invoked with the command ping.

TERM	DESCRIPTION
PPM	Parts Per Million. This is a measurement of accuracy, or the expected error in one million events. Therefore one PPM means that 999,999 to 1,000,0001 events occurred when 1,000,000 were expected. This is 0.0001% error. For example, a household clock that is one second accurate per day is 11.5 ppm, or would need to be 0.086 seconds incorrect per day to be one ppm.
PRI	Primary Rate Interface. This is a connection to the PSTN where a number of trunk channels are multiplexed onto a common connection. Both T1 and E1 variants are available.
Private Cloud	UC Enterprise Solution Private Cloud architecture
Private Cloud, Shared Services	UC Enterprise Solution Solution Private Cloud, Shared Services architecture
PSTN	Public Switched Telephone Network. The telephone network that provides local and long distance connections, e.g. Bell, AT&T, British Telecom.
PTT	Poste Telefonie Telegrafie. PSTN services. Some countries combine postal services and telephony under a common service provider, e.g. the government.
RAD	Recorded Announcement Device.
RAID	Redundant Array of Independent Disks. Array of hard drives on which the information is duplicated. A controller manages the disks, switching automatically from the primary to the secondary in the event of the failure of the primary hard drive.
RDN	Remote Directory Number. The Remote DN Table is used to identify alternate ICPs to check for availability of devices, and to determine if a device is located on the Primary or Secondary ICP.
RFC	Request For Comments. A document that is created, maintained and distributed by the Internet Engineering Task Force. An RFC is the vehicle that is used to discuss and evolve a networking related protocol. RFCs usually get approved and issued as standards.
RFP	Radio Fixed Parts. The Radio Fixed Parts (RFPs) connect to the MiVoice Business 3300 ICP through the LAN. The wireless phones communicate with the RFPs using standard Digital Enhanced Cordless Telecommunications (DECT) protocol.
RGP	Router Gateway Protocol. A means whereby routers on a common subnet can communicate with and identify each other. Useful when ICMP Re-direct is needed to identify an alternative path.
RIP	Routing Information Protocol. A networking protocol that maintains a database of network hosts and routers and exchanges information about the architecture of the network.
RSTP	Rapid Spanning Tree Protocol. A version of STP that will converge networks more rapidly than STP (see STP).
RTC	Real Time Complex. This is the control block within an ICP. This includes Call Control and internal controls for the unit.
RTP	Real Time Protocol. Protocol used to identify sequence of voice packets with timing information before being sent to a user via UDP.
SAC	Switch Application Communications
SAN	Storage Area Network, A dedicated high-speed network (or subnetwork) that interconnects and presents shared pools of storage devices to multiple servers.
SB architecture	MiCloud Business Solution Small Business architecture

TERM	DESCRIPTION
Scalable	MiCloud Business Solution Scalable architecture
SET	System Engineering Tool. Used for calculating system parameters, limits and allowable additions.
SIP	Session Initiation Protocol. An IETF standard for signaling over IP.
SMB	MiCloud Business Solution Small Medium Business architecture
SMB-LD	MiCloud Business Solution Small Medium Business, Low Density UCC architecture
Static IP	An IP address that has been manually assigned and fixed. Typically, static addresses are exceptions within DHCP.
STP	Spanning Tree Protocol. A means whereby the network can determine multiple paths between two points and disconnect them to leave a single path, removing broadcast issues.
Subnet	A subnet (short for “subnetwork”) is an identifiably separate part of an organization's network. Typically, a subnet may represent all the machines at one geographic location, in one building, or on the same local area network (LAN).
SWB	Mitel Sales WorkBench
T.37	Internet Protocol for FAX (Store and Forward). A means of taking a TDM FAX, converting it to data, passing it via IP and reconverting it back to TDM.
T.38	Internet Protocol for FAX (Real Time). Similar to T.37 in function, but carried out in real time, i.e. with minimum delay.
T1	Primary Rate. Provides 23 or 24 channels of trunks per connection.
TAPI	Telephony Applications Programming Interface. TAPI is a standard programming interface that lets you and your computer communicate over telephones or video phones to end-users or phone-connected resources.
TAR	Tape Archive and Retrieval. A file transfer utility.
TCP	Transmission Control Protocol. The methods of transmitting data between two end-points using IP with acknowledgement.
TDM	Time Division Multiplex. A means of combining a number of digitally encoded data or voice channels onto a common digital stream, e.g. T1.
TFTP	Trivial File Transfer Protocol. A simplified version of FTP used to transfer data with minimal overhead.
TOS	Type of Service. A field within the Layer 3 (IP) encapsulation layer to identify some properties relating to service parameters; in this case, delay and priority of handling.
UDP	User Datagram Protocol. A layer 4 protocol with minimal handshaking and overhead. Used to stream voice. Considered connection-less.
ULM	UCC License Manager
Unicast	A process of transmitting messages from one source to one destination, as opposed to a broadcast or multicast.
UPS	Uninterruptible Power Supply. A unit capable of providing output power for a period of time when the local mains supply fails. Usually relies on storage devices such as batteries.

TERM	DESCRIPTION
UTP	Unshielded Twisted Pair. Cable that reduces emissions and maintains an impedance match through the twists per metre in the cable without resorting to shielding.
VLAN	Virtual LAN. A means of providing virtual LANs on a network using common physical components. Such VLANs are logically unconnected except through some Layer 3 device.
WAN	Wide Area Network. A network connection to a network that could be global, e.g. via Frame Relay.
Wi-Fi	Wi-Fi Alliance technology for Wireless LAN based on IEEE 802.11.
WLAN	Wireless LAN
WAV	WAVE file. WAV is an audio file format, created by Microsoft, that has become a standard PC audio file format for everything from system and game sounds to CD-quality audio. A Wave file is identified by a file name extension of .wav.