Technical Overview

Mitel® MiCloud Telepo for Service Providers 4.2

Key Features

- For the enterprise market
- Enable service providers to offer advanced business communication
- A complete, open and pure software solution
- Secure
- Multi-tenant
- Cloud-based
- Integrates with your IT systems
- Easy to operate and maintain
- Management, service and edge nodes build redundancy into system

The MiCloud Telepo for service providers enables you to get ahead in the enterprise market by offering advanced business communication as an end-to-end Service from the cloud. The proven solution offers short time to market with a low risk and delivers a superior user-centric experience that seamlessly integrates mobile and fixed communication, Voice over IP and existing enterprise voice infrastructure while addressing all security requirements that today's cloud communication demands.

MiCloud Telepo is a pure software solution built for deployment by operators and service providers with traditional telecom networks as well as new cloud environments and is designed to enable business communication as a service. It delivers secure and ready to use services to enterprises by re-use of existing internet or telephony networks. By hiding the technical complexity from the customers and end users, it gives them an easy to use solution that can be used with computers, mobile phones, tablets and fixed phones.

Its architecture delivers an end-to-end truly multi-tenant business class internet service based on modern design and open standards.

MiCloud Telepo enables service providers to deploy new services rapidly and experience best in class service life cycle management over time. They can provide services to their customers based on the latest available software without extensive testing or costly and time-consuming integration projects.

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The Cloud is the New IT Environment for Enterprises

The business communication and applications markets are undergoing a fast and dramatic change. Mature fixed and data networks, which are secure and robust, give professional users access to selected applications in a flexible manner.

New cloud business models and software-based solutions allow small enterprises to use applications that were previously only available to larger organizations. These make them more efficient, flexible and faster in addressing their customer needs or running their company.

End users select the best possible application and device available to solve their individual professional and personal needs. By offering cloud-based communication services, service providers can start generating new revenue streams and further strengthen top line business.

It is now time for communication applications like PBX, attendant and contact center to enter the same paradigm, but with a twist - they need to be integrated with other applications, be delivered on preferred devices and be easy to use, just like MiCloud Telepo.

Key Features

- Increase workday efficiency
- Broaden your communication choices
- Stay connected wherever you are
- Improve customer responsiveness
- Simplify mobility
- Reduce costs across the board

Our End-to-End Philosophy

MiCloud Telepo was designed from the start as a complete solution with a superior user experience and ease of use as the top priorities. To address this, MiCloud Telepo offers the whole chain of functionality that is required when delivering a working service combined with back-end capabilities that work seamlessly with PC, Mac and mobile applications. All delivered as part of one solution.

MiCloud Telepo is managed by one management system and provides one management API to be integrated with operators' IT systems making it easy to integrate, provision and maintain. This means that operators don't need a best of breed multi-vendor approach to this, as it often leaves customers with jigsaw pieces that do not fit together and is a nightmare to take to market and manage.

Efficient organization and user administration is crucial to quickly deploy to new enterprise customers and keep end user administration costs low. To increase flexibility and minimize support requests, MiCloud Telepo delivers extensive web-based administration interfaces for service providers, enterprises and end users – the latter two can be tailored with inherited rules, user profiles and access rights.

The user experience and its branding are both vital deliverables for any service provider. A MiCloud Telepo solution can be offered to the market under one or multiple brands. This enables a service provider to host services for other resellers, sell under several brands packaged differently to different market segments or sell in several geographical markets but adapted to local branding, languages and packaging.

Easy to Operate and Manage

MiCloud Telepo is designed as an end-to-end multi-tenant business communication solution. This capability is embedded in all system nodes and management services. It delivers multi-tenant functionality not only for numbering plans per user group but for all categories of users in or administrating the system, with support for multi-level administration and tailored rights.

Multi-tenancy means that each enterprise or organization defined in the service provider's offer has its own "solution". In practice this means that every enterprise and end user experiences all the features and functions as if they were dedicated to them.

All resources are shared in the system, but with multi-tenancy end users perceive them as dedicated to them from functional, traffic and security perspectives.

MiCloud Telepo powered service providers can always evolve their business using the latest possible software with access to the newest features and functions. A service provider running MiCloud Telepo has access to pre-tested releases and all new software is delivered branded and ready to use. New releases can be rolled out without affecting the usage and new functionality is locked into license agreements.

MiCloud Telepo provides a set of applications to improve the end user experience of having computers or smartphones as the preferred communication device. However, fixed desk and conference phones, along with low and mid range mobile phones are also supported with-out the need for installed applications. The combination with broad support of terminal platforms and well-integrated applications ensures that users can use company selected or bring their own devices to work and still have the same business class user experience.

To stay competitive and have the ability to adapt packaging to different user and market segment need, MiCloud Telepo provides a set of tools for service providers to form and adapt their market offerings. Service providers can package different feature sets using one set of software. This is done via the management system where major features and functions can be switched on or off depending on packaging strategy for individual user groups. Functionality levels for users can therefore easily scale between low-end basic IPPBX users to high end unified communication users, attendants, contact center and automatic call distributor (ACD) users.

Solution Deployment

A typical MiCloud Telepo deployment consists of several logical nodes distributed across a number of virtual or physical servers on geographically separate sites for scalability, security and redundancy reasons.
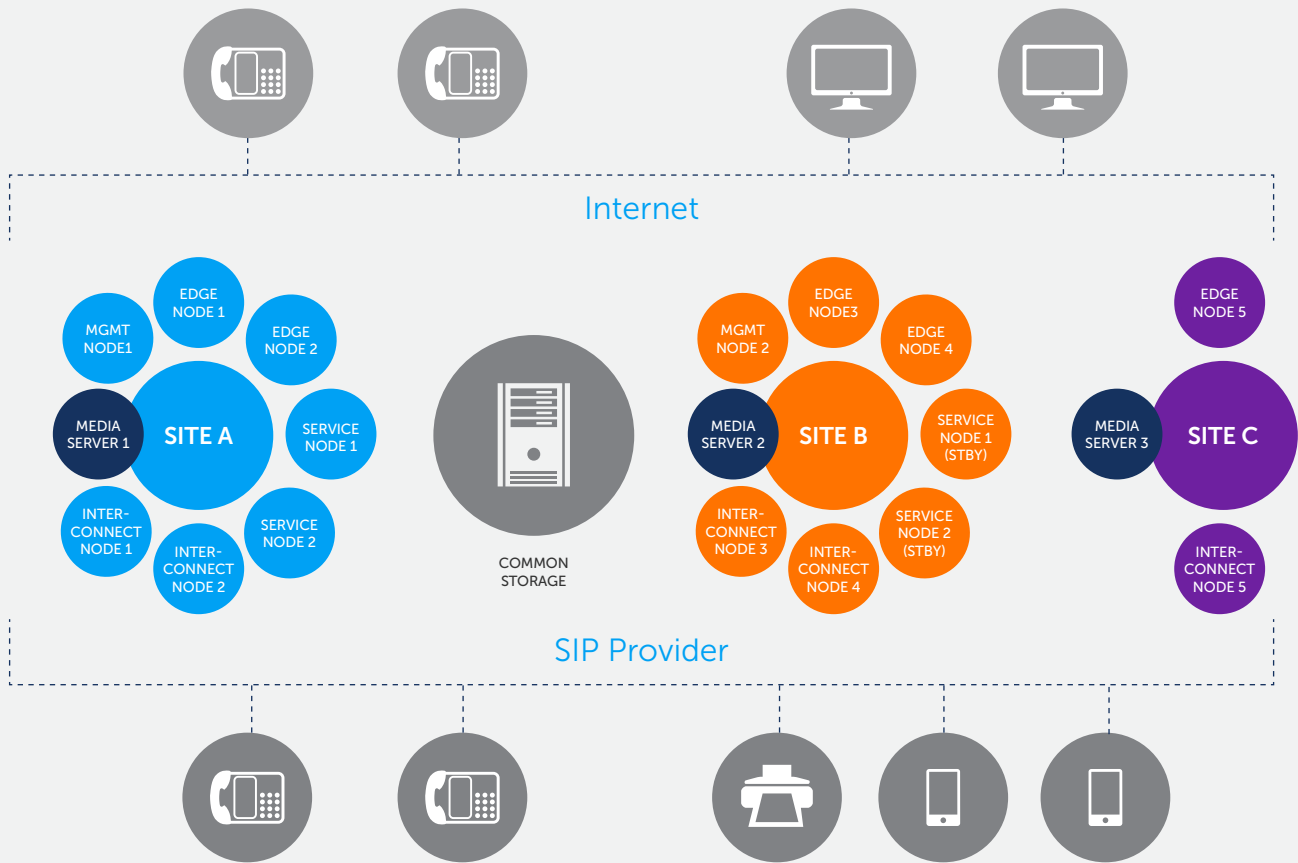
Management Node

The Management Node manages the entire system and is the single point of entry for all management and provisioning services. It delivers a complete and comprehensive overview of the deployed end-to-end solution. It also provides the APIs for integrating the whole solution towards BSS and OSS systems. The Management Node manages all other nodes and all system wide services in the system and delivers one provisioning interface for the entire end-to-end solution, reducing the integration and management complexity of issues like upgrades, changes, additions or provisioning.

The Management Node is deployed in one pair on separate sites with a failover logic in order to eliminate the single point of failure. The capacity of the Management Node pair ensures that the system can scale according to geographical and capacity needs without adding new complexity to the solution management or provisioning. It is capable of managing a MiCloud Telepo deployment consisting of hundreds of nodes.

MiCloud Telepo

MiCloud Telepo delivers secure and ready to use services to enterprises by re-use of existing internet or telephony networks. By hiding the technical complexity from the customers and end users, it gives them an easy to use solution that can be used with computers, mobile phones, tablets and fixed phones.

Operations Support System (OSS) Integration

Each of the MiCloud Telepo Nodes offers simple network management protocol (SNMP) system and service monitoring, Netrac alarm connection and exposes Java management extensions (JMX) for performance monitoring.

The Management Node also includes a built-in system overview where the overall state of the deployed system and alerts are exposed. The Management Node offers monitoring of the core services in the solution and offers netrac connection for alarms as well as separate SNMP or email/sms notifications upon failure.

Business Support System (BSS) Integration

The Management Node exposes a single point of application programming interfaces (APIs) for integration with external BSS systems. This allows for full automation of Move, Add, Change and Disconnect (MACD) operations of user and organization configurations.

The Service Nodes produce Charging Detail Record (CDR) files to be used by an external billing system.

Edge Node

The Edge Node is placed on the edge of the network to provide access to the services from the internet. It serves three main purposes:

- *Dealing with the security related demands of accessing the services from the internet*
- *Distributing the load among the Service Nodes to ensure scalability of the solution*
- *Ensuring that the service works for users residing on a private IP network behind a network address translation (NAT). This is typically an issue for voice over IP services based on SIP than other solutions.*

The Edge Node eliminates the need for a third party Session Border Controller (SBC) which typically adds high cost, complexity of deployment and interoperability issues.

The Edge Node hosts a SIP and HTTP proxy that authentcates each incoming request towards the Services Nodes before they are passed further. It also handles certificates and encryption of the traffic in the solution.

To address NAT traversal complexity it provides a media relay function that is invoked when needed. Media is not relayed through the Edge Node in case two people on the same network call each other. This saves bandwidth for the enterprise.

The Edge Nodes are a common resource within each service provider's network and are shared between all end users of every enterprise customer. As any end user can use any Edge Node the MiCloud Telepo simply allocates them to whichever one is best for traffic optimization, quality of service and security at that time. This automatically builds redundancy into the system and as with the other nodes multiple Edge Nodes are deployed to ensure availability. Each Edge Node can manage up to hundred thousand end users and additional nodes can be added in order to increase overall capacity or meet geographical needs.

Incoming traffic is distributed among the Edge Nodes using DNS load balancing. This reduces the need for investment in any third party load balancing equipment. The Edge Node passes on the incoming requests to the service node that the organization belongs to after authentication of the requests.

Service Node

The Service Node executes the services in the system. Each Service Node is self-contained with all the functionality required to provide services to an organization. This simplifies the dimensioning of a running system since it is easy to measure the performance of a running node and determine if additional nodes must be added to the system. Other solutions that use function specific nodes, for example dedicated presence servers or call controllers etc., make the dimensioning of the solution harder as different organizations may use different resources that are hard to predict.

Service Nodes are deployed in fully redundant pairs and when the load on a pair exceeds the recommended capacity usage another pair can easily be added to the solution.

The Service Node can be dedicated for one enterprise or be a shared resource for multiple enterprises, it is truly multi-tenant and each customer will experience a unique and dedicated service.

Each Service Node delivers its own CDRs, exported to external storage. The comma separated formatted output allows for import in a multitude of system for a fully customized billing.

Interconnect Node

The Interconnect Node offers a similar role as the Edge Node to facilitate the protection of the Service Nodes and direct incoming traffic to the right Service Node. While Edge Nodes face the Internet the Interconnect Node faces the SIP trunk providers who offer telephony network services for the solution. The Interconnect Node also offers some additional functionality such as dual tone multi-frequency (DTMF) tone detection from media streams in case the SIP trunk provider does not support out of band DTMF signaling.

Media Server

The media server provides common media resources for conferencing, voice prompting and recordings. Customers can select products from Audiocodes or Dialogic.

Firewalls

The firewalls provides needed security levels accessing and between selected segments cross the solution.

Storage

The storage segment is used to store any CDR and system back-up data.

Security Design

MiCloud Telepo is designed to allow secure hosting of provided business communication services. Security is integral to all elements and services within the solution.

The following security aspects are within the solution:

- *Intrusion prevention*
- *Personal integrity*
- *Denial of service attacks*
- *Theft of a service*

The nodes are deployed in different network segments with firewall rules limiting the traffic allowed to pass between the segments. Standard firewall equipment is used for this purpose and for intrusion protection.

The solution includes mechanisms for fraud detection and brute force password hacker attacks.

The system provides audit logs storing all administrative changes that provide information of who changed what and when. In addition the Edge Nodes offer an access log keeping track of all connections made to the system.

The end-to-end solution uses different technologies to ensure a secure, but user-friendly communication environment. MiCloud Telepo uses technologies and protocols such as SSH, HTTPS, SIP/TLS, and SRTP to ensure valid encryption and access security where feasible. You can create a multitude of custom administration profiles in the solution. All the important features can be set for an administrator to either be hidden, visible but locked or configurable. This way the administration capabilities on superuser/system level, organization level and user level can be mapped to your specific need.

Scalability

Any communication solution based on the MiCloud Telepo can be cost effectively designed to fit a small-scale enterprise as well as large multi-national deployments using the same software.

The solution scalability is built upon a model where different organizations are partitioned to belong to different Service Node pairs, and the Edge Node directs the incoming traffic to the right node. Once the capacity limit for a pair is reached another pair is added to host the new organizations. The Service Nodes may host hundreds of thousands of active users divided among multiple organizations.

The MiCloud Telepo only needs a pair of each type of node to ensure full redundancy in the system, i.e. minimal configuration for a redundant solution is only eight servers.

Reliability and Availability

MiCloud Telepo is designed for carrier deployment without any single points of failure to be able to deal with unexpected hardware or software failure without causing inconvenience for the users of the services.

The solution also offers tools to make planned maintenance such as software upgrades or hardware maintenance convenient for the users.

Virtualization

MiCloud Telepo solution software could be deployed on either physical or virtual servers. Mitel is committed to the evolution of virtualized environments and the great benefits that bring, such as enhanced maintenance and operation of the servers and software.

Network Agnostic

In order to deliver a true cloud solution and an excellent user experience in private or public cloud environments, modern solutions must be able to leverage existing network capabilities such as mobile and fixed telecom networks. At the same time it must securely use the internet as the main access network for the end user.

MiCloud Telepo has proven record of integrating with legacy network and using features such as mobile line state, mobile extension, billing, provisioning and PSTN access trunks. It is designed to integrate with several different operator accesses in one or several geographical markets, from one single installation.

Since MiCloud Telepo has a loose coupling to the network infrastructure it has a great fit regardless if you are a traditional telephony operator that owns the network infrastructure or if you are looking to add value as an independent service on top of existing fixed and mobile network subscriptions.

Use Solution Openness

MiCloud Telepo is based on open standards and protocols and exposes APIs for third party developers such as SIP, HTTP and JSON to integrate with the surrounding environment over IP and the internet.

The solution offers APIs both for integration with administrative systems as well to be used by end users of the solution for integration with their own systems and applications in a web 2.0 manner.

Deployment Requirements

MiCloud Telepo software runs on the Linux SuSE operating system and on commercial off-the-shelf (COTS) hardware or on a virtualization environment such as Citrix XenServer.

The solution requires little additional software investments, support licenses for SuSE Enterprise Linux and MySQL database is the only commercial requirements.

In addition to this, Oracle Java must be downloaded and installed on the servers.

To ensure that the solution is deployed in a secure manner it must be combined with firewall equipment configured according to the MiCloud Telepo guidelines.

Media servers are required to facilitate voice prompt playouts and conference services.

A SIP trunk is required to interconnect with public fixed and mobile telephony networks and a SMS solution is needed for the services that use SMS messages.

To ensure that all servers have the same time an NTP time source must be available and a domain name system (DNS) server for the domain hosting the services must be configured with the required information for SIP and HTTP load balancing and node information.

A web server to serve IP phones with firmware must be available.

More information

For more information about our apps and solution give us a call, or download and read our other product sheets from www.mitel.com

Open Minded Through Standards

- *RFC 1565 - Network monitoring MIB*
- *RFC 2327 - SDP*
- *RFC 2571 - SNMPv3*
- *RFC 2616 - HTTP*
- *RFC 3261 - Session Initiation Protocol*
- *RFC 3263 - Locating SIP servers*
- *RFC 3264 - Offer/Answer model*
- *RFC 3265 - SIP Specific Event Notifications*
- *RFC 3323 - Privacy*
- *RFC 3325 - Asserted Identity*
- *RFC 3326 - Reason header*
- *RFC 3489 - STUN*
- *RFC 3362 - Image/t38*
- *RFC 3515 - SIP Refer*
- *RFC 3550 - RTP*
- *RFC 3581 - Symmetrical response routing*
- *RFC 3711 - SRTP*
- *RFC 3842 - SIP Message Waiting Indication*
- *RFC 3856 - Presence event package*
- *RFC 3863 - PIDF presence format*
- *RFC 3891 - Replaces: header extension*
- *RFC 3892 - SIP Referred-by header extension*
- *RFC 3903 - Publish*
- *RFC 3911 - Join: header extension*

- *RFC 4028 - Session timer*
- *RFC 4220 - Basic network media services*
- *RFC 4235 - Dialog event package*
- *RFC 4244 - Request history information*
- *RFC 4480 - RPID format*
- *RFC 4538 - SIP target dialog extension*
- *RFC 4568 - SRTP key exchange in SDP*
- *RFC 4662 - Event notification for resource lists*
- *RFC 4722 - MSCML*
- *RFC 4733 - RTP payload for DTMF*
- *RFC 4905 - Representing Trunk Groups*
- *RFC 4961 - Symmetric RTP*
- *RFC 5806 - Diversion Indication*
- *RFC 5626 - Client initiated connections*
- *RFC 5627 - GRUU*
- *RFC 6086 - SIP INFO*