



# Scalable contact centre solutions with *intelligentContact*™

Scalability and high availability are the essential, but competing, properties of all enterprise solutions today. The architecture of high throughput contact centre products has to be designed to support several major objectives for the final solutions to function: **scalability, remote management, interoperability and high availability**. **Praveen Vermula** – CTO of **mplSystems** – discusses how to ensure you meet all these objectives, and more, in the most cost effective way.

**Scalability** of your contact centre system is of paramount importance as this ensure that increasing call volumes, along with the resultant increase in connections, end points, functionality and users, can be supported. Key questions to ask of any 'market leading' solution are:

- » Can capacity be achieved in cost effective increments?
- » Is there minimal impact on the total cost of ownership?
- » Can existing hardware/software remain in place?
- » Will there be the minimal amount of disruption?
- » Can we avoid complete re-engineering of systems in order to implement additional services?

**Remote management** is the capability of the system to be integrated with the standard OSS/BSS solutions and, therefore, be accessed, controlled and maintained remotely. Standards-based interfaces and protocols should be used to enable smooth integration between the remote management products and the networking equipment.

**Interoperability** is another crucial objective for any contact centre solution, where hardware and software components, from a variety of vendors, have to operate seamlessly. Interoperability is usually achieved by checking compliance to the appropriate standards and by performing physical testing involving equipment from several suppliers.

**Availability**, whilst simply meaning that the solution should always work effectively, is the most demanding objective. In a high throughput environment, the meaning of 'always' is the solution should provide services 99.999% of the time (the '5 nines model').

Implementation of additional system functions, such as reliability, resilience, hot swap, seamless software upgrade, redundancy and protection mechanisms, contribute to enabling high availability and service continuity.





# Features, Scalability & Redundancy

## Features

The **reliability** feature is frequently misinterpreted and often regarded as a synonym for high quality. Having high quality within the system is certainly important but, in high throughput environments, reliability and **resilience** usually refer to the ability of a system to perform under critical conditions, which could be, for example, severe traffic load creating control application delays.

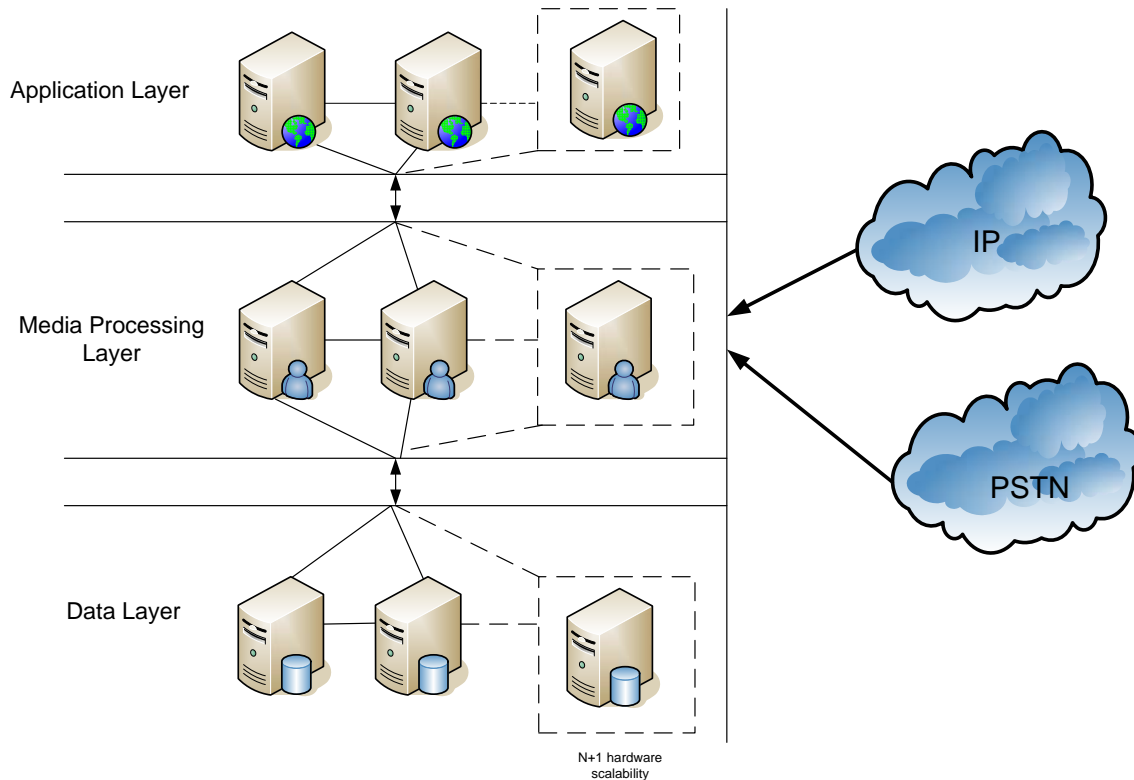
**Hot swap** is a low level feature which enables the removal and insertion of a hardware component from/to the system without the need for powering down and a system reboot. This is used for 'live' system maintenance and upgrades and the hot swap elements of a system usually include interface or media processing cards, switch boards, power supplies, fan units and fan controller boards.

The meaning of the **seamless software upgrade** feature is self evident; the maintenance of the software elements in a solution could require upgrades, which should be done on a 'live' system and without causing an interruption to the system operation and performance. Having the capability to perform a seamless software upgrade allows the network to remain available whilst implementing new functionality and maintaining active calls, therefore significantly reducing 'no service' time for the solution.

The **redundancy** feature is the ability of a system to keep functioning normally in the event of a component failure, by having backup components that perform duplicate functions. Redundancy is all about **eliminating a single point of failure** by introducing alternative hardware and software elements and allowing for automatic detection and recovery from element failures without impacting calls that are in progress. This feature should be implemented utilising **protection** mechanisms according to any of the standard protection schemes.

## N+1 Scalability and Redundancy

Providing a scalable and high availability solution at a reduced total cost of ownership is a real challenge. However, utilising the N+1 scalability and redundancy scheme it is possible to achieve both objectives at a lower cost. The core architecture of **intelligentContact™** is based on an N-tier componentised model allowing for modular physical deployment of the end solution. By utilising this model in a contact centre solution the media processing layer can be physically separated from the core application and data layers. This, in turn, allows each physical layer to be scaled by additional hardware, seamlessly and without affecting the live operational environment.



The diagram above illustrates a typical implementation of **intelligentContact**. This solution architecture can be repeated in multiple geographic locations providing a complete distributed, scalable and high availability contact centre solution. **intelligentContact** can be configured to be aware of deployments in multiple geographic locations thus allowing Pier-to-Pier media routing decisions to be made over a distributed architecture. The solution supports data layer replication where every change to the database is replicated real-time to any other deployments of **intelligentContact** within an enterprise. This provides automatic geographical redundancy as well as automatic load balancing capabilities.



## Media Processing Layer Architecture

At the heart of the Media Processing Layer is the Aculab Prosody telephony card that processes both VoIP and PSTN communications. This architectural approach to providing a converged environment reduces the processing load on the media servers as voice processing is carried out on the DSP chips on the Prosody X cards. Each media server is capable of running 4 Prosody X cards with each card being **hot-swappable**; this provides a further layer of protection ensuring high availability of the solution in the low level architecture. Each Prosody X card is capable of running 8 E1/T1/VoIP connections totalling a channel count of 240. This enables a single server to serve up to 1000 agent. The N+1 architecture then allows further media processing servers to be added seamlessly into the solution scaling up as the number of agents increase.

All of the physical layers that make up the architecture for **intelligentContact** support remote management. The Aculab Prosody X cards have standard built in support for SNMP which coupled with SNMP support provided by the over all server architecture allows for standards compliant remote management capabilities. As well as SNMP support, **intelligentContact** has a bespoke remote management / self monitoring solution based on standard XML Web Service technology. The system can be monitored and configured remotely through a browser based administration portal as well being able to notify administrators of any exceptions that may occur.

Typical specification for media processing servers are shown below:

No. of Agents	No. of Aculab cards	No. of Servers	Server Specification
100	1 x Prosody X	1	Dual Core Intel® Xeon® 5110, 4MB Cache, 1.6GHz, 1066FSB, 2GB System RAM, Adaptec PCI ATA RAID 2400A with onboard RAM, 4 x 250GB Hitachi IDE HDD (RAID 1). Windows Server 2003 Standard Edition
500	2 x Prosody X	1	Dual Core Intel® Xeon® 5110, 4MB Cache, 1.6GHz, 1066FSB, 4GB System RAM, Adaptec PCI ATA RAID 2400A with onboard RAM, 4 x 250GB Hitachi IDE HDD (RAID 1). Windows Server 2003 Standard Edition
1000	4 x Prosody X	1	Dual Core Intel® Xeon® 5110, 4MB Cache, 1.6GHz, 1066FSB, 8GB System RAM, Adaptec PCI ATA RAID 2400A with onboard RAM, 4 x 250GB Hitachi IDE HDD (RAID 1). Windows Server 2003 x64 Standard Edition

The Application and Data Layer servers would be of a similar specification to ensure optimal performance as the media processing layer is scaled up. A single application and data layer server is capable of servicing multiple media servers and vice versa.

As well as processing voice the media processing layer also provides multimedia queuing and routing. It handles all forms of communication media including email, click-to-chat, fax, SMS, workflow and escalation. Integrated skills based and priority routing can be configured to ensure all contacts are intelligently delivered to the most appropriate user.

## Interoperability

Unlike most contact centre solutions - multi-vendor/multi-component solutions that have been integrated - **intelligentContact** has been built from the ground up with interoperability in mind. All logical and physical layers of the solution are fully integrated and completely interoperable as part of a single vendor solution. All hardware and software components of **intelligentContact** are designed, developed and maintained by **mpSystems**. Furthermore, **intelligentContact** has been built using Service Oriented Architecture allowing for a flexible platform for integration with back office and line of business applications used in the contact centre.



# About *mpl*Systems

## Conclusion

It is becoming imperative for enterprises to enhance their converged network platforms for the delivery of innovative, next generation services for their organisations and customers.

With *mpl*Systems and *intelligentContact*™, the implementation of high end multimedia contact centre solutions, at a low total cost of ownership, is now feasible. By utilising distributed architecture inherent to the IP environment, and incorporating all the ingredients of traditional contact centre solutions e.g. ACD, CTI, IVR, scripting package, database, messaging, workflow, scheduling, reporting and business applications, *intelligentContact* provides highly available, interoperable and scalable contact centre solutions from 4 to 4000 seats.

## About *mpl*Systems

*mpl*Systems is the technology division of The Message Pad Ltd. The company was founded in 1994 to fulfil the growing need of companies wishing to improve service to customers in contact centres and, together, *mpl*Systems and Message Pad have now become the UK's leading providers of contact centre solutions and outsourced services using the *intelligentContact* technology.

Working with over a thousand clients in industry sectors from financial services to utilities, we focus on transforming CRM theory into a real and positive customer experience for all our clients.



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