



**MapleWorks Management System:
Differentiating OAM&P Products;
Reducing Time-to-Market**

A MapleWorks White Paper

May 2009

INTRODUCTION

Regardless of the model, your element management system and network management system (EMS/NMS) are key competitive differentiators. How you achieve that differentiation is a matter of strategy.

FCAPS (Fault, Configuration, Accounting, Performance and Security) is probably the best-known management reference model. OAM&P (Operations, Administration, Maintenance and Provisioning) is an alternative to the FCAPS categorization of management functions is. The OAM&P model is popular with large telecommunications service providers, whose internal organization aligns better with the OAM&P model than FCAPS. The FCAPS model is more popular with enterprises and data providers.

There are three approaches to achieving a highly differentiated NMS: build in-house, buy off-the-shelf, or partner with an experienced developer that will tailor a NMS to your unique specifications.

This white paper presents the latter approach as a solid strategy for small- to medium-sized telecom/data equipment vendors who want to differentiate their product and achieve the benefits that come with a reduced time-to-market.

DEVELOPMENT EXPERTISE COUNTS

There's a key reason that the big telecom/data equipment vendors have their own EMS/NMS applications: they have delivered adequate solutions in their markets that provide the required FCAPS functionality to support their equipment. Small- to medium-sized vendors, on the other hand, are in a difficult competitive position. A solid user-friendly and manageable product is required to compete against these major providers—and come out with a winning solution.

MapleWorks Technology has many years of experience developing custom NMSs for small, medium, and large organizations. We provide customers with the option of building from the ground up or building upon our field-proven MapleWorks Management System (MMS) framework. In both scenarios our deep domain expertise in this space gives you confidence that you have chosen the partner that holds the right knowledge to build a successful NMS to meet your unique requirements.

Access specialized expertise. Rely on experts at MapleWorks who hold specialized expertise in NMS application development.

Start with the field-proven MMS. MapleWorks has a proven product that we tailor to meet your requirements.

Reduce time-to-market. Working with MapleWorks gives you a headstart and increases the likelihood of delivering product faster than a home-grown solution and more highly customized and differentiated than an off-the-shelf application.

Reduce cost of development. With outsourcing to MapleWorks in Ottawa, Ontario, Canada, the development costs are usually 30-40% less than local development costs found in the United States.

CORE FUNCTIONS OF A NMS

- Provisioning
- Monitoring
- Fault management
- Report generation
- Policy management
- Configuration management

Increase revenues. Not only does getting to market faster give you a jumpstart on bringing in revenue, working with an experienced developer ensures the end product is highly differentiated to achieve the end game of attracting and impressing new customers.

FIRST IMPRESSIONS COUNT

While you must weigh different architectures and technologies, it's the impression that the end product makes on your prospective customer that determines if you have a winning solution. An impactful and positive first impression is created by many factors. Our experience reveals that the top three factors are:

Look and feel of the application.

Ease of use of the application.

Solid coverage of the **FCAPS functionality** customized for the network that is to be managed.

BEST PRACTICES COUNT

MapleWorks Management System is based on years of experience. The MMS system architecture uses standard approaches and technologies.

TECHNOLOGIES USED IN THE MMS SYSTEM ARCHITECTURE

GUI: Java/Swing, multi-threading, Axis, WSDL

MMS Server: C++, event-driven, SOAP

Database: ODBC, SQLite

SNMP

Agent/Manager: net-SNMP

Authentication: EAP/RADIUS

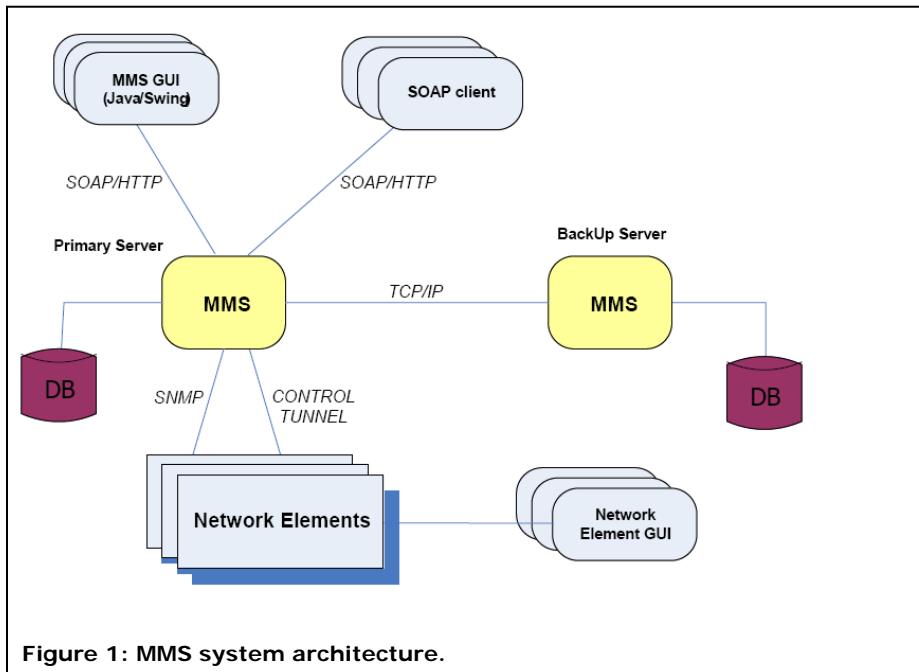


Figure 1: MMS system architecture.

The main application screen presents a comprehensive view of the managed network, as well as the most commonly detailed information. In a typical network, this includes a list of all managed nodes, status of nodes, fault summary, server status, logged in user information, and more. In a telecom network, this may be the topology view of the managed network.

An organized screen

The layout of the screens is important to your customers. This gives that all-important positive first impression of the application. The information presented here is grouped according to relevance and mapped on the screen. Highly customizable, information can be grouped according to needs and preferences. Foremost, it shows the nodes that are being managed. This is typically a tree view on the left of the screen. If group features are supported, then the groups are displayed and the nodes under the groups are viewed by expanding the group.

The individual nodes provide current status to the MMS Server, and both the nodes and the groups display alarm summary counts. The main area of the screen is used to view and configure functionality provided by the MMS application. Your customers are then able to easily navigate between these views to access different functionalities while the rest of the screen displays real-time status information.

Easy-on-the-eyes colors and icons

Color and icon selections are important from your customers' perspectives. These are carefully coordinated to ensure that they're able to clearly view the information on the screen. In general, neutral colors are used as much as possible to make sure that the color-coded alarm information is easily distinguishable. Another of the areas where there is room for creativity is your display of topology information. This is due to the number of nodes being displayed, as well as the type of network connectivity.

Visually coordinated mesh connectivity

Displaying mesh connectivity isn't the same as displaying a linear network. In the MMS, the graphics representing the topology are well-designed and suitable for the entity they represent—and are visually well coordinated. While this is a challenge in applications that do multi-vendor network management, MapleWorks has successfully overcome the challenge.

Accordion-style drill-down views

In the case of the topology display, there are several options to present the information. Among these is the use of expand/collapse capability for the node graphics, node annotations, layered view and/or drill down views. The objective is to present the network topology in a clutter-free form, and at the same time provide the capability to delve further to obtain more detailed information.

As you can see in **Figure 2** on page 5, the MMS follows best practices. The information presented is clear and concise ensuring that your customers are able to easily navigate the screens and also drill down to obtain more details.

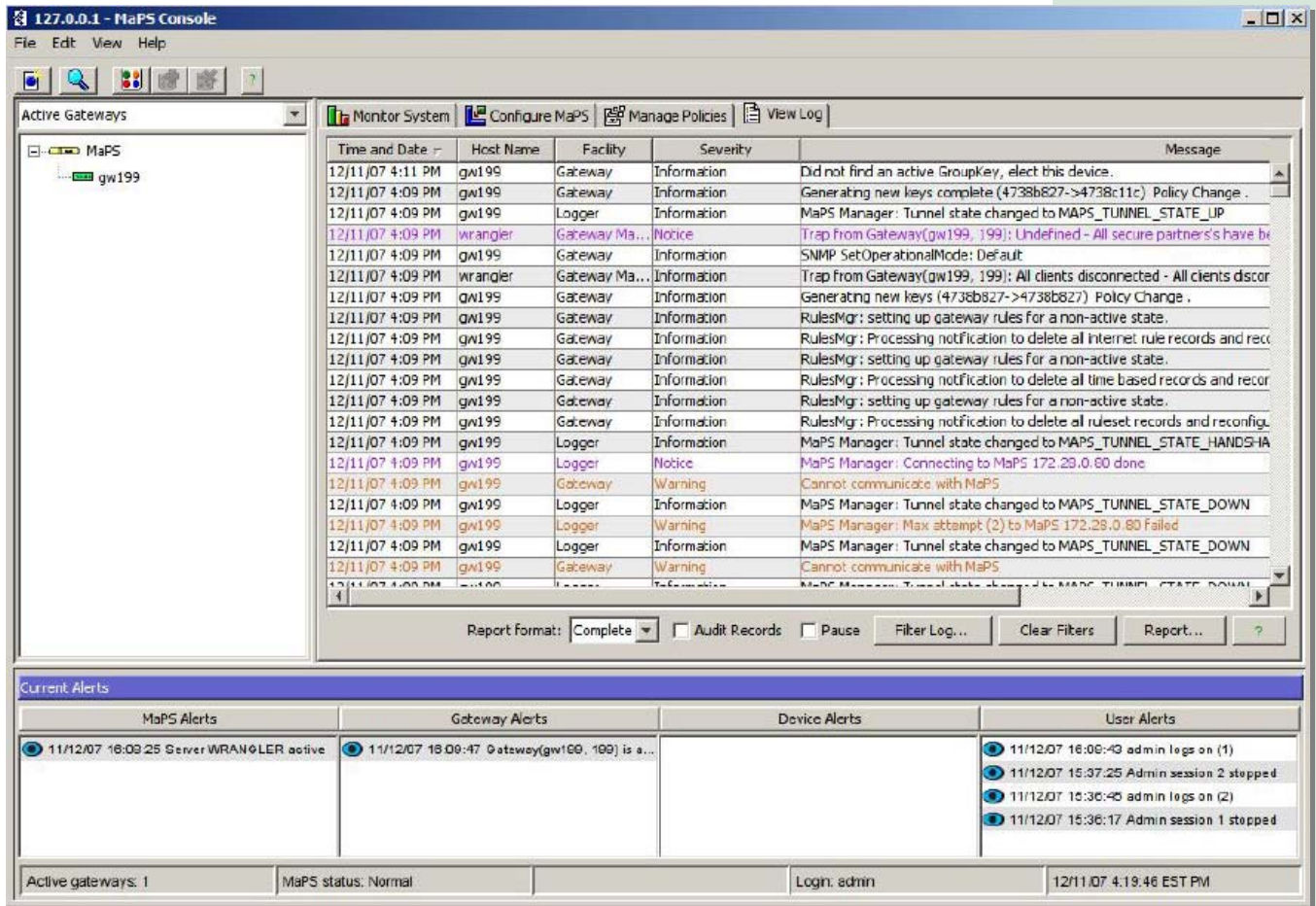


Figure 2: MMS GUI.

TECH TALK

Now that we've discussed best practices in design, here are some details of MapleWorks Management System, the solution that fast-tracks your end product to market.

The MMS architecture (**Figures 3 and 4**) simplifies management so that your customers can configure or implement an action to all devices or groups of devices versus individual devices on the network.

MMS FEATURES

- Rules-based access control to network elements via policies:
 - time-based rules,
 - network resources,
 - and group-associated rules
- Authentication services: device and user levels
- Secure communication
- High availability architecture
- Real-time alert monitoring
- Log audits
- Multiple version support
- Mass configuration deployment

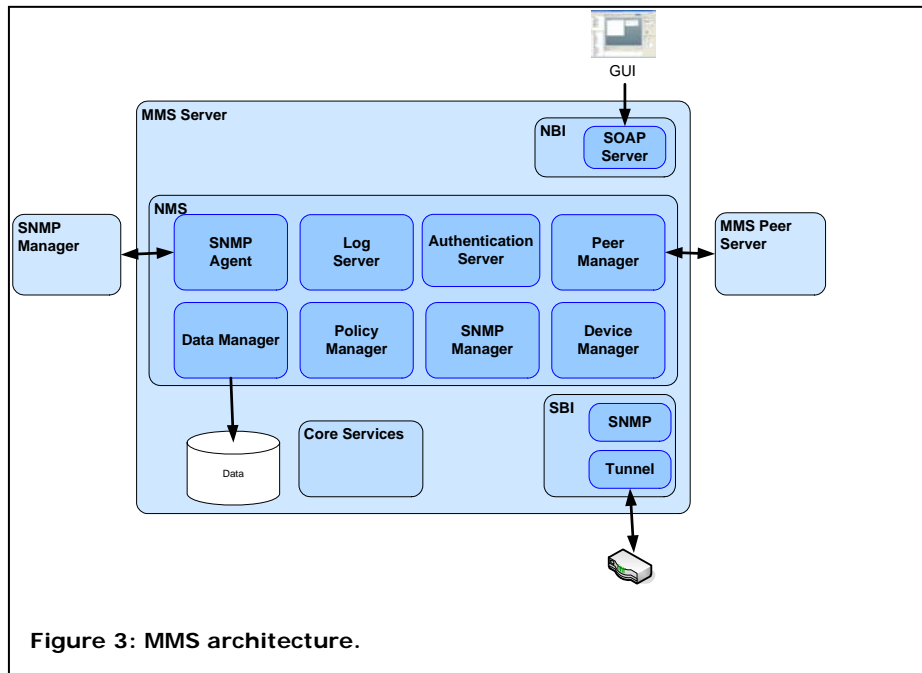


Figure 3: MMS architecture.

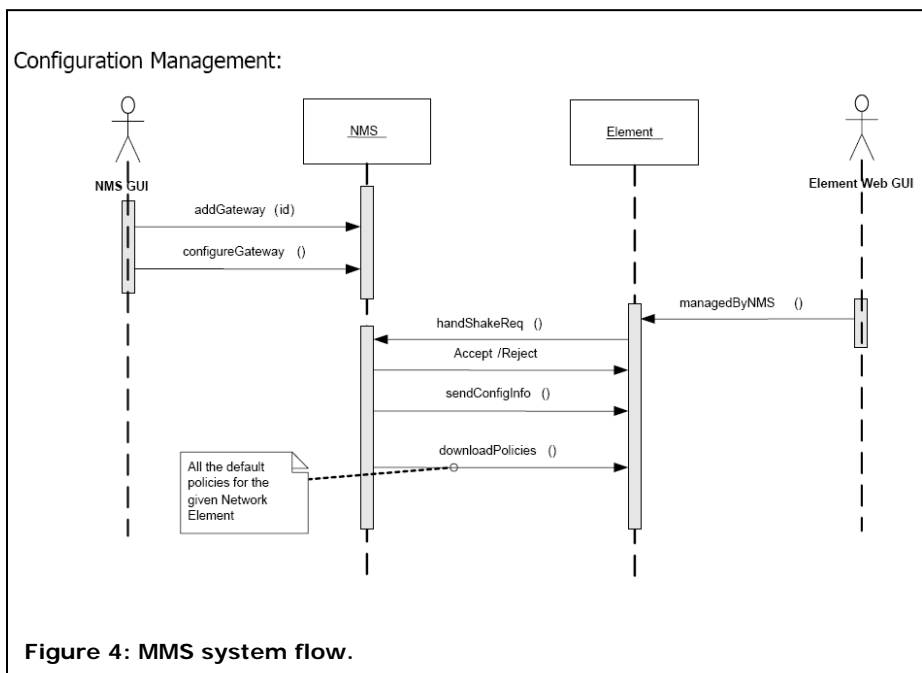


Figure 4: MMS system flow.

THE BOTTOM LINE

MapleWorks is the right choice to build the network management system that will meet your requirements.

Rely on the experts at MapleWorks who hold **specialized expertise** in NMS application development.

Start with the field-proven MMS that MapleWorks tailors to meet your unique requirements.

Working with MapleWorks **reduces time-to-market** while delivering a product that is more highly customized than off-the-shelf applications.

Increase revenues. Not only does getting to market faster give you a jumpstart on revenues, working with an experienced developer and reducing the **cost of development** ensures that the end product is highly differentiated to achieve the end game of attracting and impressing new customers.

A differentiated and well-designed NMS should be intuitive, provide easy-to-use features, and have well thought-out functionality. In a crowded and competitive market space, you want your prospects' first review of your NMS product to be a positive, impactful impression. MapleWorks Technology is the right choice to help you achieve your goals.

THE AUTHOR OF THIS WHITE PAPER

The author of this white paper, MapleWorks Technology, is an experienced source of **software development services** for developers of **networking and communication products** for both the service provider and enterprise markets.

MapleWorks offers clients the following value:

Rich communications DNA

- o Average of 15 years experience in the network communications domain
- o Located in Silicon Valley North, their staff has experience from Nortel, Mitel, Siemens, RIM, etc.
- o Staff is technology focused and invest in staying on top of emerging technologies

Factors contributing to MapleWorks' proven track record of bringing products to market on time and on budget are the company's expert engineers and a proprietary **fluid, hybrid development process called MapleWorks OnTrack™**

Business practices

- o IP protection is respected and is the same as in the USA
- o Onshore service provider; therefore, visas are not required
- o Face-to-face knowledge transfer at client's site
- o Management philosophy is one of minimal handholding, operating in a fluid environment, and successfully adapting to each client's development processes

Business environment

- o Development culture is the same as the USA
- o English is the primary language
- o Close proximity to the Ottawa International Airport enables day trips or single overnight stays
- o Similar time zone
- o Geopolitical stability means no risk to client projects

Variable development cost is 30-40% less than in the USA

MapleWorks holds membership with each of the following industry associations:

Massachusetts Technology Leadership Council (MTLC) – www.masstlc.org

Massachusetts Network Communications Council (MassNetComms) – www.massnetcomms.org

Canadian Advanced Technology Alliance (CATA) – www.cata.ca

Ottawa Centre for Research and Innovation (OCRI) – www.ocri.ca

If you have questions about your outsourcing project, we invite you to contact us by phone at 781.897.1727 or send email to info@mapleworks.com



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