

# **NATIONAL ENTERPRISE ARCHITECTURE FRAMEWORK KINGDOM OF BAHRAIN**

## **Technology Standards and Guidelines**

### **Enterprise IT Management Domain**



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## 1. INTRODUCTION

This document covers tools, technologies and standards used in the Enterprise IT Management domain. The process of arriving at these standards has been outlined in the NEAF - Technology Standards Methodology & Process document in Section 3 - Methodology and Approach. Some of the tools, technologies and standards have been identified as potential requirements and hence been incorporated in this document. These may be considered as recommendations for current and future use.

This document shall be considered for revision in conjunction with the NEAF - Technology Standards Methodology & Process document at appropriate intervals of time as decided by the ICT Governance Committee. Any addition or upgrade to these tools and standards may be incorporated by following the process described in the NEAF - Technology Standards Methodology & Process document in Section 6 - Review and Maintenance of Technology Standards and Guidelines.

## 2. SUMMARY OF TECHNOLOGY STANDARDS/SPECIFICATIONS AND TOOLS

This section contains a summary of standards and tools applicable to the Enterprise IT Management domain. These have been grouped into sub-sections (categories), with each category addressing one aspect of the related standards and tools. Further details and links to these standards and tools have been provided in the following sections of this document.

The rationale for selection of these standards and tools are :

- Based on the usage across ministries as captured in the internal survey.
- Technology best practices.
- References from international standards bodies.

### 2.1. IT SERVICE MANAGEMENT

Introduction to Sub-Category	<ul style="list-style-type: none"> <li>▪ ITIL® is the only consistent and comprehensive documentation of best practice for IT Service Management.</li> <li>▪ Used by thousands of organisations around the world, a whole ITIL philosophy has grown up around the guidance contained within the ITIL books and the supporting professional qualification scheme.</li> </ul>
Applicable Standard(s)	<ul style="list-style-type: none"> <li>▪ ITIL – (<a href="#">Details</a>)</li> </ul>
Remarks	
Exceptions	

### 2.2. MANAGEMENT PROTOCOLS

Introduction to Sub-Category	<ul style="list-style-type: none"> <li>▪ Simple Network Management Protocol (SNMP) is a UDP-based network protocol. It is used mostly in network management systems to monitor network-attached devices for conditions that warrant administrative attention. SNMP is a component of the Internet Protocol Suite as defined by the Internet Engineering Task Force (IETF). It consists of a set of standards for network management, including an application layer protocol, a database schema, and a set of data objects.</li> <li>▪ SNMP exposes management data in the form of variables on the managed systems, which describe the system configuration. These variables can then be queried (and sometimes set) by managing applications.</li> </ul>
Applicable Standard(s)	<ul style="list-style-type: none"> <li>▪ SNMP – (<a href="#">Details</a>)</li> </ul>

Remarks	
Exceptions	

### 2.3. MONITORING AND PROTOCOL ACCESS

Introduction to Sub-Category	<ul style="list-style-type: none"> <li>▪ The Remote Network MONitoring (RMON) MIB was developed by the IETF to support monitoring and protocol analysis of LANs. The original version (sometimes referred to as RMON1) focused on OSI Layer 1 and Layer 2 information in Ethernet and Token Ring networks.</li> <li>▪ It has been extended by RMON2 which adds support for Network- and Application-layer monitoring and by SMON which adds support for switched networks. It is an industry standard specification that provides much of the functionality offered by proprietary network analyzers. RMON agents are built into many high-end switches and routers.</li> </ul>
Applicable Standard(s)	<ul style="list-style-type: none"> <li>▪ RMON – (<a href="#">Details</a>)</li> </ul>
Remarks	
Exceptions	

### 2.4. NETWORK MANAGEMENT AND MONITORING SYSTEMS

Introduction to Sub-Category	<ul style="list-style-type: none"> <li>▪ Network management refers to the activities, methods, procedures, and tools that pertain to the operation, administration, maintenance, and provisioning of networked systems.</li> </ul>
Applicable Standard(s)	<ul style="list-style-type: none"> <li>▪ CiscoWorks LAN Management Solution – (<a href="#">Details</a>)</li> <li>▪ Cisco Network Analysis Module – (<a href="#">Details</a>)</li> <li>▪ ManageEngine OpManager and Netflow Analyzer – (<a href="#">Details</a>)</li> <li>▪ HP Network Node Manager and HP Network Automation software – (<a href="#">Details</a>)</li> <li>▪ IBM Tivoli NetView – (<a href="#">Details</a>)</li> <li>▪ CA Products for Network Management – (<a href="#">Details</a>)</li> <li>▪ NTOP – (<a href="#">Details</a>)</li> <li>▪ MRTG – (<a href="#">Details</a>)</li> <li>▪ Nagios – (<a href="#">Details</a>)</li> <li>▪ PRTG Network Monitor – (<a href="#">Details</a>)</li> </ul>
Remarks	
Exceptions	

## 2.5. IT OPERATIONS MANAGEMENT SYSTEMS

Introduction to Sub-Category	<ul style="list-style-type: none"><li>Operations management refers to enterprise-wide administration of the operations of distributed computer systems. It includes management of software inventory and installation, performance management, availability and fault management, asset management and configuration management.</li></ul>
Applicable Standard(s)	<ul style="list-style-type: none"><li>Microsoft System Center Configuration Manager – (<a href="#">Details</a>)</li><li>Microsoft System Center Operations Manager – (<a href="#">Details</a>)</li><li>IBM Tivoli Software – (<a href="#">Details</a>)</li><li>IBM System Director – (<a href="#">Details</a>)</li><li>CA IT Management Products – (<a href="#">Details</a>)</li><li>BMC IT Management Products – (<a href="#">Details</a>)</li><li>HP Business Technology Optimization Software – (<a href="#">Details</a>)</li></ul>
Remarks	
Exceptions	

## 2.6. BACKUP AND RECOVERY

Introduction to Sub-Category	<ul style="list-style-type: none"><li>Data Management defines the set of capabilities that support the usage, processing and general administration of unstructured information. Data backup and recovery defines the set of capabilities that support the restoration and stabilization of data sets to a consistent, desired state.</li></ul>
Applicable Standard(s)	<ul style="list-style-type: none"><li>Symantec Backup Exec – (<a href="#">Details</a>)</li><li>Symantec NetBackup – (<a href="#">Details</a>)</li><li>IBM Tivoli Storage Manager – (<a href="#">Details</a>)</li><li>HP Data Protector – (<a href="#">Details</a>)</li></ul>
Remarks	
Exceptions	

## 2.7. HELPDESK SOFTWARE

Introduction to Sub-Category	<ul style="list-style-type: none"><li>A helpdesk is an information and assistance resource that troubleshoots problems with computers or similar products. Corporations often provide help desk support to their customers via a toll-free number, website and/or e-mail. There are also in-house helpdesks geared toward providing the same kind of help for employees only. In the Information</li></ul>
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	Technology Infrastructure Library, within companies adhering to ISO/IEC 20000 or seeking to implement IT Service Management best practice, a helpdesk may offer a wider range of user centric services and be part of a larger Service Desk.
Applicable Standard(s)	<ul style="list-style-type: none"> <li>▪ HP ServiceCenter software – (<a href="#">Details</a>)</li> <li>▪ BMC Remedy Service Desk – (<a href="#">Details</a>)</li> <li>▪ Numara Track-It – (<a href="#">Details</a>)</li> <li>▪ ManageEngine ServiceDesk – (<a href="#">Details</a>)</li> <li>▪ Oracle PeopleSoft Enterprise HelpDesk – (<a href="#">Details</a>)</li> </ul>
Remarks	
Exceptions	



### 3. DETAILS OF STANDARDS / SPECIFICATIONS AND ASSOCIATED GUIDELINES

This section provides a brief description of the relevant standards listed in section 2 along with links for references to these standards.

3.1. SNMP	
Description	<ul style="list-style-type: none"><li>▪ The Simple Network Management Protocol (SNMP) is an application layer protocol that facilitates the exchange of management information between network devices. It is part of the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite.</li><li>▪ An SNMP-managed network consists of three key components: managed devices, agents, and network-management systems (NMSs).</li></ul>
Applicable to	<ul style="list-style-type: none"><li>▪ Management Protocols</li></ul>
Reference(s)	<ul style="list-style-type: none"><li>▪ <a href="http://tools.ietf.org/html/rfc1157">http://tools.ietf.org/html/rfc1157</a></li><li>▪ <a href="http://tools.ietf.org/html/rfc3411">http://tools.ietf.org/html/rfc3411</a></li><li>▪ </li></ul>
Remarks:	<ul style="list-style-type: none"><li>▪ SNMP enables network administrators to manage network performance, find and solve network problems, and plan for network growth.</li></ul>

3.2. RMON	
Description	<ul style="list-style-type: none"><li>▪ Remote Monitoring (RMON) is a standard monitoring specification that enables various network monitors and console systems to exchange network-monitoring data. RMON provides network administrators with more freedom in selecting network-monitoring probes and consoles with features that meet their particular networking needs.</li><li>▪ The RMON specification defines a set of statistics and functions that can be exchanged between RMON-compliant console managers and network probes.</li></ul>
Applicable to	<ul style="list-style-type: none"><li>▪ Monitoring and Protocol Access</li></ul>
Reference(s)	<ul style="list-style-type: none"><li>▪ <a href="http://tools.ietf.org/html/rfc2819">http://tools.ietf.org/html/rfc2819</a></li><li>▪ <a href="http://tools.ietf.org/html/rfc3577">http://tools.ietf.org/html/rfc3577</a></li><li>▪ </li></ul>

Remarks	<ul style="list-style-type: none"> <li>▪ It is a proposed standard in 1992 as RFC 1271 (for Ethernet). RMON then became a draft standard in 1995 as RFC 1757.</li> <li>▪ RMON provides network administrators with comprehensive network-fault diagnosis, planning, and performance-tuning information.</li> </ul>
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3.3. ITIL	
Description	<ul style="list-style-type: none"> <li>▪ As IT services become more closely aligned and integrated with the business, ITIL assists in establishing a business management approach and discipline to IT Service Management, stressing the complementary aspects of running IT like a business. Service Management is a set of specialized organizational capabilities for providing value to customers in the form of services.</li> <li>▪ The core of Service Management is transforming resources into valuable services . ITIL Addresses Service Strategy Service Design (models for productive operation) Service Transition (service implementation/launch) Service Operation (productive operation of services) Continual Service Improvement.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>▪ IT Service Management</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>▪ <a href="http://www.itil-itsm-world.com/">http://www.itil-itsm-world.com/</a></li> <li>▪ <a href="http://www.itil.co.uk/">http://www.itil.co.uk/</a></li> </ul>
Remarks	<ul style="list-style-type: none"> <li>▪ ITIL is the most widely accepted approach to IT service management in the world. ITIL provides a cohesive set of best practice, drawn from the public and private sectors internationally.</li> <li>▪ It is supported by a comprehensive qualifications scheme, accredited training organisations, and implementation and assessment tools.</li> </ul>

## 4. DETAILS OF TOOLS SUPPORTING RECOMMENDED STANDARDS

This section provides a brief description of the relevant tools listed in section 2 along with links for references to these tools.

4.1. SYMANTEC BACKUP EXEC / NETBACKUP	
Description	<ul style="list-style-type: none"> <li>▪ Backup Exec is backup software currently developed by Symantec. Support for version 9.X and 8.X ended in 2007. Version 10.X has entered in the final phase of support. Version 12.5 is the latest available.</li> <li>▪ NetBackup is an enterprise level heterogeneous backup and recovery suite. It provides cross-platform backup functionality to a large variety of Windows, UNIX and Linux operating systems. Support for version 5.X ended in 2007. Version 6.5 is the latest available and was released in 2007.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>▪ Backup and Recovery</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>▪ Symantec Backup Exec <a href="http://www.symantec.com/business/products/family.jsp?familyid=backupexec">http://www.symantec.com/business/products/family.jsp?familyid=backupexec</a></li> <li>▪ <a href="http://www.symantec.com/backupexec/">http://www.symantec.com/backupexec/</a></li> <li>▪ Symantec NetBackup <a href="http://www.symantec.com/business/netbackup">http://www.symantec.com/business/netbackup</a></li> </ul>
Remarks	

4.2. IBM TIVOLI STORAGE MANAGER	
Description	<ul style="list-style-type: none"> <li>▪ IBM Tivoli Storage Manager (TSM) is a centralized, policy-based, enterprise class, data backup and recovery software. Support for version 5.3 ended in 2008. Latest version available is 6.1 that was released in 2009.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>▪ Backup and Recovery</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>▪ IBM Tivoli Storage Manager <a href="http://www-01.ibm.com/software/tivoli/products/storage-mgr">http://www-01.ibm.com/software/tivoli/products/storage-mgr</a></li> </ul>
Remarks	

4.3. HP DATA PROTECTOR	
Description	<ul style="list-style-type: none"> <li>▪ HP Data Protector is a backup software to automate high-performance, scalable backup and recovery. Support for version 5.1 ended in 2008 whereas support for 5.5 will end in</li> </ul>

	2010. 6.2 is the latest version available.
Applicable to	<ul style="list-style-type: none"> <li>Backup and Recovery</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>HP Data Protector <a href="http://www8.hp.com/us/en/software-solutions/software.html?compURI=1175640">http://www8.hp.com/us/en/software-solutions/software.html?compURI=1175640</a></li> </ul>
Remarks	

#### 4.4. HP SERVICE MANAGER

Description	<ul style="list-style-type: none"> <li>HP Service Manager is a comprehensive and fully integrated IT service management suite. It enables to automate all IT service management capabilities.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>Helpdesk Software</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>HP ServiceCenter Software <a href="http://h20229.www2.hp.com/products/ovsc/index.html">http://h20229.www2.hp.com/products/ovsc/index.html</a></li> <li><a href="http://www8.hp.com/us/en/software-solutions/software.html?compURI=1173779#tab=TAB2">http://www8.hp.com/us/en/software-solutions/software.html?compURI=1173779#tab=TAB2</a></li> </ul>
Remarks	

#### 4.5. BMC REMEDY SERVICE DESK

Description	<ul style="list-style-type: none"> <li>BMC Remedy Service Desk is a leading incident and problem management solution. It integrates with a unified architecture for all IT service support functions.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>Helpdesk Software</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>BMC Remedy Service Desk <a href="http://www.bmc.com/products/product-listing/22743834-121272-1370.html">http://www.bmc.com/products/product-listing/22743834-121272-1370.html</a></li> </ul>
Remarks	

#### 4.6. NUMARA TRACK-IT

Description	<ul style="list-style-type: none"> <li>Numara Track-It is a comprehensive IT help desk and asset management solution.</li> </ul>
Applicable to	

	<ul style="list-style-type: none"> <li>Helpdesk Software</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>Numara Track-It <a href="http://www.numarasoftware.com/Track-It/help_desk_software.aspx">http://www.numarasoftware.com/Track-It/help_desk_software.aspx</a></li> </ul>
Remarks	

#### 4.7. MANAGEENGINE SERVICE DESK

Description	<ul style="list-style-type: none"> <li>ManageEngine ServiceDesk Plus is web-based helpdesk software that helps manage all service communications from a single point.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>Helpdesk Software</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>ManageEngine ServiceDesk <a href="http://www.manageengine.com/products/service-desk/">http://www.manageengine.com/products/service-desk/</a></li> </ul>
Remarks	

#### 4.8. ORACLE PEOPLESOFT ENTERPRISE HELPDESK

Description	<ul style="list-style-type: none"> <li>Oracle PeopleSoft Enterprise HelpDesk leverages real-time enterprise data to provide faster, more accurate internal support, maximize employee productivity, monitor service performance, and control service costs.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>Helpdesk Software</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>Oracle PeopleSoft Enterprise HelpDesk <a href="http://www.oracle.com/us/products/applications/peoplesoft-enterprise/crm/053329.html">http://www.oracle.com/us/products/applications/peoplesoft-enterprise/crm/053329.html</a></li> </ul>
Remarks	

#### 4.9. MICROSOFT IT OPERATIONS MANAGEMENT

Description	<ul style="list-style-type: none"> <li>System Center Configuration Manager (ConfigMgr), formerly Systems Management Server (SMS), is a systems management software product by Microsoft for managing large groups of Windows-based computer systems. Configuration Manager provides remote control, patch management, software distribution, operating system deployment, and hardware and software inventory.</li> <li>Microsoft System Center Operations Manager delivers end-to-end service management of applications and IT services running across the datacenter fabric, providing greater control</li> </ul>
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	and insight into the health and performance of Microsoft, UNIX and Linux servers, and the workloads running on them.
Applicable to	<ul style="list-style-type: none"> <li>IT Operations Management Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>System Center Configuration Manager <a href="http://www.microsoft.com/systemcenter/configurationmanager/en/us/default.aspx">http://www.microsoft.com/systemcenter/configurationmanager/en/us/default.aspx</a></li> <li>System Center Operations Manager <a href="http://www.microsoft.com/systemcenter/operationsmanager/en/us/default.aspx">http://www.microsoft.com/systemcenter/operationsmanager/en/us/default.aspx</a></li> </ul>
Remarks	

#### 4.10. IBM IT OPERATIONS MANAGEMENT

Description	<ul style="list-style-type: none"> <li>IBM Tivoli Software provides a comprehensive systems management platform from IBM.</li> <li>IBM Systems Director platform management foundation that streamlines the way physical and virtual systems are managed across a multi-system environment.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>IT Operations Management Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>IBM Tivoli Software <a href="http://www-01.ibm.com/software/tivoli/">http://www-01.ibm.com/software/tivoli/</a></li> <li>IBM Systems Director <a href="http://www-03.ibm.com/systems/management/director/">http://www-03.ibm.com/systems/management/director/</a></li> </ul>
Remarks	

#### 4.11. CA IT OPERATIONS MANAGEMENT

Description	<ul style="list-style-type: none"> <li>Computer Associates is one of the leading vendors for information technology management products with broad spectrum of products.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>IT Operations Management Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>CA IT Management Products <a href="http://cacomvip.ca.com/us/it-management-products.aspx">http://cacomvip.ca.com/us/it-management-products.aspx</a></li> </ul>
Remarks	

#### 4.12. BMC IT OPERATIONS MANAGEMENT

Description	<ul style="list-style-type: none"> <li>BMC is a leading software maker specializing in information technology management. BMC develops, markets and sells software used for multiple functions, including IT service</li> </ul>
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	management, data center automation, performance management, virtualization lifecycle management and cloud computing management.
Applicable to	<ul style="list-style-type: none"> <li>▪ IT Operations Management Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>▪ BMC IT Management Products <a href="http://www.bmc.com/index.html">http://www.bmc.com/index.html</a></li> </ul>
Remarks	

#### 4.13. HP IT OPERATIONS MANAGEMENT

Description	<ul style="list-style-type: none"> <li>▪ HP Business Technology Optimization Software includes information technology management products that allow businesses to reduce costs and make better business decisions by allocating IT spend and resources based on business priorities; automating key processes across IT strategy, applications, and operations; and measuring IT effectiveness and efficiency from a business perspective.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>▪ IT Operations Management Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>▪ HP Business Technology Optimization Software</li> <li>▪ <a href="http://www8.hp.com/us/en/software/enterprise-software.html">http://www8.hp.com/us/en/software/enterprise-software.html</a></li> <li>▪ <a href="http://www8.hp.com/us/en/software-solutions/software.html?compURI=1215996">http://www8.hp.com/us/en/software-solutions/software.html?compURI=1215996</a></li> </ul>
Remarks	

#### 4.14. CISCO NETWORK MANAGEMENT AND MONITORING

Description	<ul style="list-style-type: none"> <li>▪ CiscoWorks LAN Management Solution (LMS) is a suite of powerful management tools that simplify the configuration, administration, monitoring, and troubleshooting of Cisco networks.</li> <li>▪ The Cisco Network Analysis Module (NAM) family of products improves visibility into network performance to help manage and improve application delivery.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>▪ Network Management And Monitoring Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>▪ CiscoWorks LAN Management Solution <a href="http://www.cisco.com/en/US/products/sw/cscowork/ps2425/">http://www.cisco.com/en/US/products/sw/cscowork/ps2425/</a></li> <li>▪ Cisco Network Analysis Module <a href="http://www.cisco.com/en/US/products/ps5740/Products_Sub_Category_Home.html">http://www.cisco.com/en/US/products/ps5740/Products_Sub_Category_Home.html</a></li> </ul>
Remarks	

#### 4.15. MANAGEENGINE NETWORK MANAGEMENT AND MONITORING

Description	<ul style="list-style-type: none"><li>OpManager and Netflow Analyzer are network monitoring and network bandwidth monitoring tools from ManageEngine.</li></ul>
Applicable to	<ul style="list-style-type: none"><li>Network Management And Monitoring Systems</li></ul>
Reference(s)	<ul style="list-style-type: none"><li>ManageEngine <a href="http://www.manageengine.com">http://www.manageengine.com</a></li></ul>
Remarks	

#### 4.16. HP NETWORK MANAGEMENT AND MONITORING

Description	<ul style="list-style-type: none"><li>HP Network Node Manager and HP Network Automation software are products from HP for network management and network configuration management respectively.</li></ul>
Applicable to	<ul style="list-style-type: none"><li>Network Management And Monitoring Systems</li></ul>
Reference(s)	<ul style="list-style-type: none"><li>HP Software &amp; Solutions <a href="http://openview.hp.com">http://openview.hp.com</a></li><li><a href="http://h17007.www1.hp.com/us/en/products/network-management/HP_PCM_Plus_Network_Management_Software_Series/index.aspx?jumpid=reg_r1002_usen">http://h17007.www1.hp.com/us/en/products/network-management/HP_PCM_Plus_Network_Management_Software_Series/index.aspx?jumpid=reg_r1002_usen</a></li></ul>
Remarks	

#### 4.17. IBM NETWORK MANAGEMENT AND MONITORING

Description	<ul style="list-style-type: none"><li>IBM Tivoli NetView is distributed network management software.</li></ul>
Applicable to	<ul style="list-style-type: none"><li>Network Management And Monitoring Systems</li></ul>
Reference(s)	<ul style="list-style-type: none"><li>IBM Tivoli NetView <a href="http://www.ibm.com/software/tivoli/products/netview">http://www.ibm.com/software/tivoli/products/netview</a></li></ul>
Remarks	

#### 4.18. CA NETWORK MANAGEMENT AND MONITORING

Description	
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	<ul style="list-style-type: none"> <li>CA provides number of industry leading network management products.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>Network Management And Monitoring Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>CA NSM System <a href="http://www.ca.com/us/network-management.aspx">http://www.ca.com/us/network-management.aspx</a></li> </ul>
Remarks	

#### 4.19. NTOP

Description	<ul style="list-style-type: none"> <li>ntop is a network probe that shows network usage. ntop is available for both UNIX and Win32-based platforms.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>Network Management And Monitoring Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>NTOP <a href="http://www.ntop.org">http://www.ntop.org</a></li> </ul>
Remarks	

#### 4.20. MRTG

Description	<ul style="list-style-type: none"> <li>The Multi Router Traffic Grapher, or just simply MRTG, is free software for monitoring and measuring the traffic load on network links. It allows the user to see traffic load on a network over time in graphical form.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>Network Management And Monitoring Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>MRTG <a href="http://oss.oetiker.ch/mrtg/">http://oss.oetiker.ch/mrtg/</a></li> </ul>
Remarks	

#### 4.21. NAGIOS

Description	<ul style="list-style-type: none"> <li>Nagios is a popular open source computer system and network monitoring software application. It watches hosts and services, alerting users when things go wrong and again when they get better.</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>Network Management And Monitoring Systems</li> </ul>

Reference(s)	<ul style="list-style-type: none"> <li>▪ Nagios <a href="http://www.nagios.org">http://www.nagios.org</a></li> </ul>
Remarks	

#### 4.22. PRTG NETWORK MONITOR

Description	<ul style="list-style-type: none"> <li>▪ PRTG Network Monitor is a monitoring tool from Paessler</li> <li>▪ Runs on all Windows versions XP or later: server or workstation, 32 or 64 bit. Full featured web browser based Interface using AJAX and a lighter version using HTML only, minimalistic web browser based interface (feature limited) for older browsers and mobile devices (runs on IE 6/7/8, iPhone, Android, Blackberry) . Also has a Native Windows application especially for large installations. Supports viewing monitoring data of several PRTG installations in one single application. Includes apps for iOS (iPhone/iPad) and Android smartphones / tablets: Access monitoring status while on the go. All user interfaces allow SSL-secured local and remote access and can be used simultaneously</li> </ul>
Applicable to	<ul style="list-style-type: none"> <li>▪ Network Management And Monitoring Systems</li> </ul>
Reference(s)	<ul style="list-style-type: none"> <li>▪ <a href="http://www.paessler.com/prtg/features">http://www.paessler.com/prtg/features</a></li> </ul>
Remarks	

## 5. APPENDICES

### 5.1. APPENDIX A: ABBREVIATIONS AND ACRONYMS

Abbreviation / Acronym	Enterprise IT Management
SNMP	Simple Network Management Protocol
RMON	Remote Network Monitoring
ITIL	Information Technology Infrastructure Library
MRTG	Multi Router Traffic Grapher

## 5.2. APPENDIX B: RELATED DOCUMENTS / LINKS

### Acknowledgement of major references for international technology standards and Specifications:

- Internet Engineering Task Force (IETF)  
<http://www.ietf.org>
- International Standards Organization (ISO)  
<http://www.iso.org>
- World Wide Web Consortium (W3C)  
<http://www.w3c.org>

### Acknowledgement of other references for international technology standards and specifications:

- American National Standards Institute (ANSI)  
<http://www.ansi.org>
- ECMA International  
<http://www.ecma-international.org>
- Institute of Electrical and Electronics Engineers (IEEE)  
<http://www.ieee.org>
- National Institute of Standards and Technology (NIST)  
<http://www.nist.gov>
- Object Management Group (OMG)  
<http://www.omg.org>
- Open Mobile Alliance (OMA) and WAP Forum  
<http://www.openmobilealliance.org>  
<http://www.wapforum.org>
- Organization for the Advancement of Structured Information Standards (OASIS)  
<http://www.oasis-open.org>
- Unicode, Inc.  
<http://www.unicode.org>
- ITIL  
<http://www.itiil-officialsite.com/home/home.asp>