The Goal of Network Management

The ultimate goal of network management is to lower risk, eliminate downtime and slowdowns, minimize variability, and actively support business expansion. The amount of business conducted that doesn't rely on available and performing networks is small and shrinking. A good network management system is an indispensable asset that protects the company from slowdowns and catastrophic outages that would have major business impact. But what kind of network management product do you need? Has your network reached the point where enterprise class features are necessary? If so, what does a great enterprise system look like?

Do You Really Need Enterprise Class Network Management?

Is your company ready for an enterprise-class network management system? This paper begins with an overview of the basic categories of network management products, followed by a discussion of the key features of a great enterprise management system and the signs that a business may be ready for an enterprise class solution. Finally, it demonstrates, via the Entuity integration with Oracle Enterprise Manager 12c, the benefits of integrating enterprise level network visibility into the Oracle stack.

The Network Management Landscape

Network management products typically fall into three basic categories. Enterprise class solutions let you manage the latest technologies and devices. These products provide sophisticated features for all of the requisite network monitoring functions, including detailed discovery and autodiscovery, inventory, events and root cause analysis (with features such as downstream event suppression and rules), deep elemental and flow monitoring, performance, topology, configuration, and technical and business-focused reports and dashboards.

This category includes “legacy” framework solutions, which comprise multiple point products that must be individually integrated and maintained. It also includes “all-in-one” solutions where all (or most) functionality is embedded in a single software stream, with limited or no integrations and simpler scaling depending on the product’s architecture. Both framework and all-in-one enterprise solutions offer unlimited scalability, although all-in-one solutions tend to be less labor intensive due to their more unified designs.

At the next level are low-end to intermediate SMB solutions. Like framework solutions, they involve multiple products and/or “add-ons” that require at least some integration. They usually come with a low initial price tag and cover a range of functional areas such as discovery, inventory, and events, and, in intermediate solutions, some level of autodiscovery, performance, flow, and technical reporting or graphing capabilities. Data collected by these products is not as deep
Do You Really Need Enterprise Class Network Management?

BEST PRACTICE

as that of enterprise class solutions, although some can be extended through programming. These may be effective products for smaller networks, but as networks scale bottlenecks may occur, especially in those designed with a central database.

Finally, there are free tools, some of which are basic versions of the above SMB products. These usually require manually loading devices into the system and offer a basic level of pinging or SNMP polling. They provide little to no elemental performance data and may offer rudimentary events, such as up/down device status. These tools are best suited for small networks of about 20 to 30 devices.

Evaluating Network Management Products

Many IT directors evaluate network management products without a strategy, often considering a broad mix of free tools, low-end to intermediate SMB products, and enterprise class solutions at the same time. That’s like going car shopping and looking at a Yugo, a Porsche, and a Sherman tank. It begs the question: what are you going to do with this vehicle: pick up your children from school (safe car), take your mother-in-law to the hairdresser (cheap car), invade a small country (massive weapon), or race in the Indy 500 (fast car)?

Let’s look more closely at enterprise class. What does that mean, and is it for you? Not everyone needs enterprise level network management. If you have a network of only a dozen devices that are all stored in the same closet, you likely don’t need an enterprise solution. Free or SMB tools will suffice. They’ll tell you if the device is up or down in a simple list, and if you need to reboot a device, you simply go to the closet and turn it off and on again.

The first sign that you need an enterprise class network management solution is when it is really important that the network be continually up, but you can no longer draw a picture of your network on a whiteboard. When a network gets to be a few hundred devices or larger, you can no longer completely understand it. Therefore, you can no longer troubleshoot it in your head. This is when you need a management solution that can “crawl” the network and do it for you.

There are fundamental capabilities you should expect from an enterprise class network management solution as outlined in the next sections.

Discovery of Device Inventory and Topology

You cannot be expected to manually load the network device inventory into a network management system. It must auto-discover what you have, and do so continually. Networks change. Frequently. Furthermore, it must also discover the topology of the network, not require you to manually input what you think is how the network is connected. This sounds pretty basic, but it’s surprising how many SMB solutions cannot do this.

Root Cause Analysis

Lower end products are “red light / green light” products: they tell you what is up and what is down, in a list. Lists are useful when there are only a dozen or so devices in the network, but when there are hundreds or thousands of devices, lists are useless. You need a solution that not only tells you that something is wrong, but also tells you where the problem is. Dozens of network devices may be unreachable, but there is likely only one that is the true cause of the problem. This is why topology is so important.

Performance

A network that’s performing poorly is actually worse than a network that’s down. If your network is down, you go do something else to be productive. If a network is just very slow, you sit in front of your computer waiting for things to happen, wasting time and getting frustrated. A good enterprise class network management system monitors the performance of the network at the device level and with an eye toward application flow as well.
Configuration

Though it’s widely accepted as truth that 90% of the problems on a network occur as a result of someone changing something, it’s remarkable how few network management solutions integrate device configuration change management into their solutions. It’s either a “bolt-on” afterthought or it’s completely missing. Network change management is no longer a separate solution. It’s a part of every-day operations.

Reporting

A management solution is only as good as the information you can get out of it. Every IT department must justify themselves to the senior management of the company (and to their customers). That means they must prove to their constituents that they’re providing the service to which they committed. Different “customers” want to see data at different levels of technical complexity, and a good network management system allows them to create reports at the CIO level, as well as at the technical user level.

Service Level Monitoring

You can think just of managing components: how they interrelate, how they’re connected, their health, and so on, but grouping those components and monitoring them as a service to meet SLAs and/or ensure that end user needs are being met is what ultimately matters.

Monitoring at the service level is especially important for large networks where you can no longer keep track of every component in your head. In larger networks, appreciating the business relevance of each component means you must be able to monitor them as sub-components working together to deliver a service.

Automation and Device Support

A lot of this comes down to automation. Lower-end tools require you to manually control individual device settings, touch off reports, and load information into them. When you have a network of 10,000 devices, this is not an option. You need a network management system that automatically tracks your network inventory, runs regularly scheduled (and previously defined) reports, monitors and alerts on performance thresholds, and determines the root cause of problems.

There’s another issue that needs to be considered: device support. Lower end products don’t really dig into the network inventory since they don’t track performance or specific status of devices under management. They simply report that the device is responding or not responding. But higher order management products go into great depth of device understanding. When a network vendor comes out with a new device, the enterprise class managers need to add detailed support for that new device.

Unfortunately, the hardware vendors don’t necessarily ask the software management vendors what their release schedules are and then sync to them. It’s important to ask a network management vendor how long it takes to add support for a newly released device.

An enterprise class management solution will tell you things like the secondary power supply on your core router has failed and you are running on your primary, or the temperature on this switch is rising and the fan is failing—at this rate, it will overheat tomorrow. Issues are identified before they become problems.

“Monitoring at the service level is especially important for large networks where you can no longer keep track of every component in your head. In larger networks, appreciating the business relevance of each component means you must be able to monitor them as sub-components working together to deliver a service.”
Finally, there is the issue of operation. All this functionality needs to be usable, not just available. The product needs to be easily installed, quickly learned, and integrated in a cohesive whole.

Integrating Network Management Information into the Oracle Stack

So far, we've considered whether an enterprise class network management solution is the best choice for an organization. We've also covered the capabilities that are essential in such a solution. Let's now walk through the Entuity integration with Oracle Enterprise Manager 12c to demonstrate the benefits of bringing deep, enterprise level network visibility into the Oracle stack.

Entuity is an all-in-one network management solution that delivers all of the advanced features discussed above in a single software stream. It's also known for its openness and automated data sharing capabilities that integrate with complementary solutions. This collaboration makes it simple to share network data with the rest of the IT environment. Entuity automatically collects deep, broad, timely, and integrated network data, and passes it on in an intelligent, filtered manner to Oracle Enterprise Manager 12c via an easy-to-install plug-in.

This allows network information, including realtime events, status information and metrics, to be correlated with other IT components managed in Enterprise Manager. In addition, network administrators can drill down into Entuity from the Oracle Enterprise Manager console using in-context links for deeper investigation into network activity.

Oracle Enterprise Manager provides unsurpassed application behavior and performance insight by not only focusing on the applications themselves, but also backing that up with a detailed understanding of the underpinning services that the applications depend on. These underpinnings include the software dimension of middleware, databases, operating systems and virtual machines, plus the underlying hardware in the form of physical servers and storage subsystems. Although facilities exist to gather specified metrics about network equipment directly using Oracle Enterprise Manager, it doesn’t rise to the same level of comprehensive coverage exhibited in the other areas.

The use of the Entuity Network Manager plug-in allows Entuity’s detailed and highly automated monitoring of modern complex networks to further complete the total IT stack monitoring picture.

Providing pertinent details of how each aspect of the IT stack interoperates helps operators deliver optimal behavior from the myriad of business services required by today’s large organizations. Adding detailed coverage of network technology and systems interconnections, Entuity extends the capabilities of the management team and improves their efficiency by taking the guesswork out of troubleshooting that may or may not have a network dimension.

Figure 1. Oracle Enterprise Manager console showing a summary of Entuity Network Service Targets.
Entuity automatically builds and maintains an up-to-date vision of the network infrastructure equipment, their interconnections, and the connections to hosts that use the network along with relevant metrics for devices, ports, modules, processors and many other concepts unique to networking technology (Figure 2).

Rather than burdening Oracle Enterprise Manager with all this raw information, the plug-in abstracts the underpinning network services for each higher level business application in the form of a new type of Enterprise Manager target referred to as an Entuity (EYE) Network Service target (Figure 3).

A second type of Enterprise Manager target provides a mini network dashboard and is referred to as an Entuity (EYE) Network Manager target (Figure 3). Its goal is to provide an overall health status of the network together with some high level events and alerts, such as impacting network outages, plus a basic inventory of network devices. It could also be used for monitoring of Entuity installations in a “monitor of monitors” fashion.
Entuity Network Service Target

Let’s look at an Entuity (EYE) Network Service target within Oracle Enterprise Manager. Each Entuity Network Service target represents the combined availability of a collection of network components being monitored by Entuity.

The Enterprise Manager console in Figure 4 shows an instance that is warning of an availability problem in the network components supporting the Order Processing application.

When we drill down further, we see that the root cause of the failure is that the Tampa router is currently down (Figure 5).

The components that were chosen to represent the underlying network that provides the interconnections necessary to deliver the Order Processing application can be displayed from the Enterprise Manager console using a single click on the Service Details link (Figure 5).

Looking at the Order Processing service in Entuity (Figure 6), we can see that it has been configured to require that all of its components be operational for the Service to be considered “up.” However, the Tampa router is in the “down” state.

Entuity brings in-depth, easily accessible network insight to the Oracle Enterprise Manager stack.
Do You Really Need Enterprise Class Network Management?

We can also easily view this information in the form of a topology map. Figure 7 shows that the Tampa router is down, meaning that we can’t reach its downstream devices. However, those devices are not the root cause. The root cause is the Tampa router.

Referring back to the Order Processing service configuration in Figure 6, we can see a number of different types of components. These include the Tampa router and two services: Redundant Links and Server Pool.

All of these different concepts are being combined using the network service modeling concept within Entuity. This not only shows the current availability of each relevant component, but also the logic being used to combine them into an overall availability state. When this combined availability state changes, a notification is sent to Enterprise Manager and the displayed state of the corresponding target is updated.

Looking more closely at these components within Entuity is a straightforward drill-down operation to see further details of a selected component (Figure 8). In this case, the device key metric performance indicator metrics are shown both in terms of their most recent sampled values as gauges and the last four hours of history in thumbnail charts. Further important details about this device appear at the bottom of the page. Even more detail is available via drill-downs.

In addition, a wide variety of reports are available, such as the availability report shown in Figure 9, which confirms that the Tampa router is the root cause of the Order Processing service being down. Information is also available from the Information Publisher reports, including the availability history for Entuity Network Service targets.

Figure 7. Tampa router in the down state as displayed in an Entuity topology map.

Figure 8. Entuity provides easy drill-down to see further details of selected components, such as key metric performance indicators for a device.

Figure 9. Entuity availability report showing recent loss of contact with the Tampa router.
Entuity Network Manager Target

The Entuity (EYE) Network Manager target (Figure 10) can be thought of as a general summarization dashboard. Different parts of the network are grouped together in the form of views, with those showing the lowest level of reachability for the devices listed. Again, Information Publisher reports are available, including a complete listing of all the devices and a breakout of devices by manufacturer.

Access to Full Entuity Capabilities

Access to the full capabilities of the Entuity server is available from a link in the Oracle Enterprise Manager console. Entuity has various dashboard displays that allow operators to watch a variety of aspects of network behavior, including the Status Summary Dashboard, which includes information such as service status, open incidents and device reachability.

There are also many drill-down capabilities to accelerate workflow for typical investigative tasks, such as interactive charting of any combination of monitored metrics, rapid polling of statistics, remote terminal access into network device command line interfaces directly from the web browser and many more.

Combinations of pages, either from within Entuity or external systems, can be presented in the form of custom dashboards (Figure 11). And a wide array of report styles are available, including the device inventory, which lists network devices under management along with a number of their important characteristics. All these presentations leverage the automatic and continual rediscovery mechanism that keeps Entuity updated as changes happen in the monitored network.

ABOUT ENTUITY

Entuity takes the work out of network management. Our highly automated, unified enterprise-class solution puts deep network insight at your fingertips, frees IT staff to focus on strategic projects and easily integrates with major frameworks and networking environments. Entuity’s support and services teams are frequently praised for their rapid response, networking expertise and involvement in special engagements. Founded in 1997 by two senior-level IT executives from the financial industry, Entuity is headquartered in London with US operations in Boston. For more information, visit entuity.com.