



HOW TO TAME YOUR NETWORK NOW

and be ready to transform it

THE NETWORK AS WE KNOW IT IS BEING REDEFINED

Australia's reputation as an early – and significant – adopter of cloud is ushering in hybrid IT operating models – and the management and monitoring challenges that come with it.

And as more endpoints, applications and devices are added, our vision for what the network is today will be transformed completely.

The challenge is two-fold: to stay on top of the network today while being confident in our readiness to transform it tomorrow.

You will see that this special report is broken into two parts.

In the first part, we look at how Deakin University, Telstra and an oil & gas major use SolarWinds to stay on top of the day-to-day challenges of their respective network environments. In effect, how they are taming their networks now.

The second part of the magazine is devoted to key insights to aid your preparations for the network of tomorrow.

In particular, we look at why CXOs are taking a bigger interest in the network; and how trends like agile methodologies, virtualisation and the Internet of Things (IoT) are raising the network management stakes.

I hope you find this special report valuable.

Joel Dolisy
SolarWinds CTO/CIO



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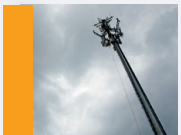
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DEAKIN UNIVERSITY

Deakin University is partway into a major service improvement initiative that is driving network visibility and process maturity across its four campuses. One component of the phased initiative is monitoring service improvement, and resulted in the deployment of several SolarWinds tools in 2014. The use of those tools is now being expanded.

Network program leader Daniel Cleary said the impetus to improve network monitoring came when other IT teams and end users found problems before the network operations team did.

"We were frequently discovering incidents from complaints," Cleary said.

"Other teams were noticing things going wrong before we did or our customers noticed that we were having incidents before we did.

"We were left trying to diagnose those incidents or understand if any changes had affected our services. It was very reactive."

Cleary's team had some tools at their disposal, but there were few processes in place on how to make use of them, and any processes that did exist were largely undocumented.

"Within the organisation people would turn up and do a 'best effort' fix," Cleary said.

"No one actually followed a process. People would just do their own thing."

While Cleary suspected a lack of maturity in the services his team offered, it took a formal analysis using the Fault, Configuration, Accounting, Performance and Security (FCAPS) model to confirm it.

"All our services were in an immature state," he said.

"Configuration management, as one example, was based on a script running to do a backup but we would only ever have one revision, so we would always overwrite the previous file. If we needed to roll back five or ten changes we couldn't do that.

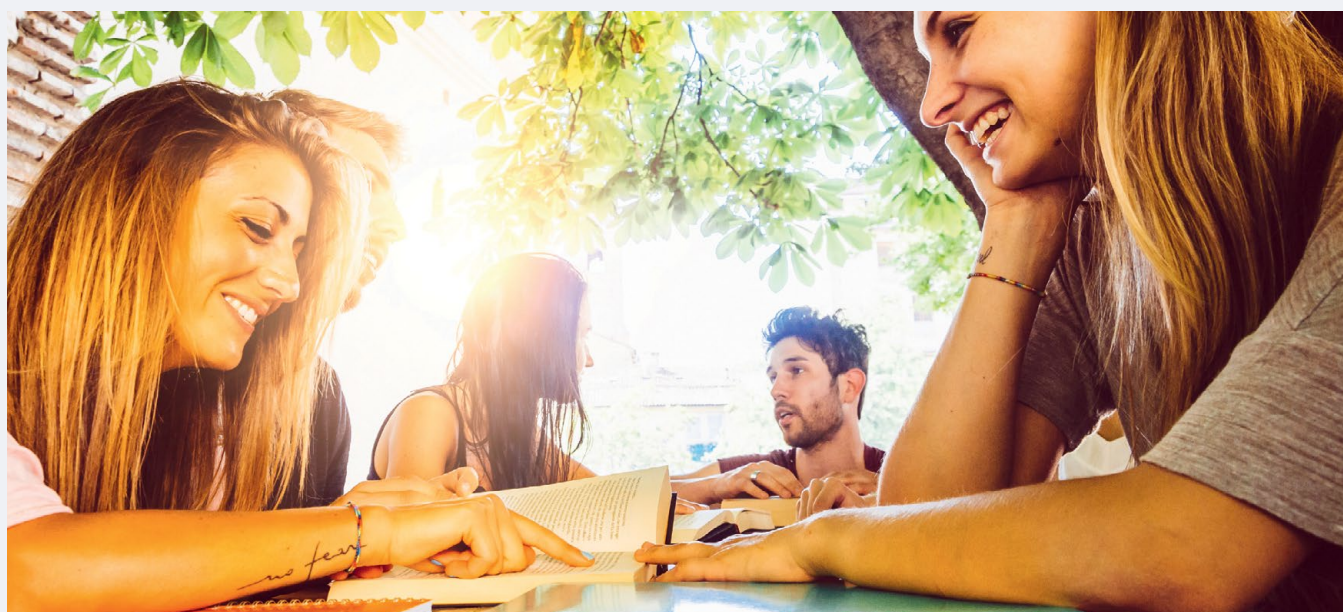
"We were doing configuration management but we weren't doing it well."

FCAPS became the baseline from which all future improvement would be measured. It was also enough to get the business case for change over the line.

"The University's eSolutions directors prioritised the work so we could begin our journey to a higher maturity level," Cleary said.

Cleary initially prioritised fault, configuration and performance management for improvement. "That's our bread-and-butter," he said.

The University selected SolarWinds as its tool of choice and engaged platinum partner Pepperstorm





Australia to assist with the implementation, which occurred over a two-week period.

"We decided to use SolarWinds based on it being a tool that was vendor agnostic and easy to use," he said.

"We have Cisco and Juniper networking equipment and it was important to us that one tool managed as many devices as possible."

Deakin deployed three tools – Network Performance Monitor (NPM) for fault and performance management, Network Configuration Management (NCM) and User Device Tracker (UDT) to keep track of devices – such as computers and wireless access points – in its environment.

The University's network includes approximately 1800 Cisco switches, 1500 wireless access points and 40,000 ports distributed across four campuses in metropolitan and regional Victoria.

One of the major changes since bedding down the first three SolarWinds tools is that the network operations team now works to defined processes.

"We have developed processes to use the tools and have had an overwhelming acceptance of them," Cleary said.

Operational staff now proactively remediate incidents before they can occur.

"SolarWinds creates a report where it randomly chooses 10 devices," Cleary said.

"It will enable us to ensure every device in the network is checked at least 2-3 times a year so we can do proactive monitoring for issues."

Another new process requires compliance checks to ensure network changes meet documented standards. Such changes could be the result of work by contractors or by "people just not following work instructions".

"We've been able to discover misconfiguration that have caused end devices to not work properly," Cleary said.

"We have a high level of visibility of each device and recent changes made to it. The visibility helps us to understand the root cause of each incident".

Buoyed by its success, the University is expanding the type of devices tracked in SolarWinds.

"Instead of just using it to monitor network devices, we will probably be adding UPS, audio-visual devices – because we're a teaching organisation, there's a lot of AV in our lecture theatres – and probably some videoconferencing as well," Cleary said, noting that would occur over the next 12 to 24 months.

Case Study



OIL & GAS MAJOR



It was early 2009 when SolarWinds took to the Thwack Community to launch its certified professional beta exam. The exam was to be opened to a "small beta audience" - and one of those accepted was Brad Peczka. "The offer came

to me from SolarWinds to be one of the first people worldwide to do it," Peczka said.

"I think I was the first person in Australia to complete the certification and I was one of the first 500 people to get it worldwide.

"I haven't been able to find anyone else in Australia who got certified before me."

Peczka is – as he was back then – the infrastructure team lead for an oil & gas major with significant operations in North-West Western Australia.

He's been with the same company – a long-term SolarWinds user – since 2008, although his exposure to the tools goes back further than that.

"I previously worked for a couple of systems integrators," Peczka said. "We used SolarWinds in various capacities there as well as the Kiwi Syslog Server tools, which SolarWinds later acquired."

Peczka oversees a geographically dispersed network environment connecting the major's Perth head office with onshore gas plants and logistics hubs, offshore unmanned platforms, and floating production storage and offloading (FPSO) vessels.

The relative remoteness of operations dictates connectivity.

"We take what we can get," Peczka said. "If you can think of a connection technology, it's in use in our environment."

The mix includes everything from frame relay links for remote telemetry stations to satellite for the FPSO vessels, and high-speed fibre, Ethernet and SHDSL for other facilities.

"We tend to choose the best connection that's available in an area, and if we can't get a solid connectivity service delivered directly to the facility we'll try and

reticulate it out there somehow, which we've done a number of times using private microwave links," he said.

The overarching engineering challenge is to ensure users receive consistent performance, regardless of where they are.

"At some sites, for example, we've got 60 people on the end of a 2Mbps VSAT link," Peczka said.

"Congestion's a problem, getting data in and out's a problem, and latency's a problem, so we have to do extensive engineering around quality of service, caching appliances, and deciding what we host onsite as opposed to what we deliver out of our centralised services pool.

"Then you go the other way and you've got 30 people hanging off an 8Mbps fibre link or a 14Mbps microwave link."

The company's general infrastructure strategy is to host only critical services at remote sites – enough to guarantee baseline network service.

"We centralise everything else out of Perth," Peczka said.

"Delivering applications over the network means the network link is critical. We can't take large variances in latency and we can't take big outages."

It is not just business traffic that traverses the company's links. With facilities and staff working in remote parts of Australia, "generally we're the only game in town as far as connectivity goes.

"We endeavour to try and strike a happy balance between business-related traffic and what we call social-related traffic," Peczka said.

"We provide a 'social network' at each facility where staff can connect their iPads and laptops, and get access to the internet.

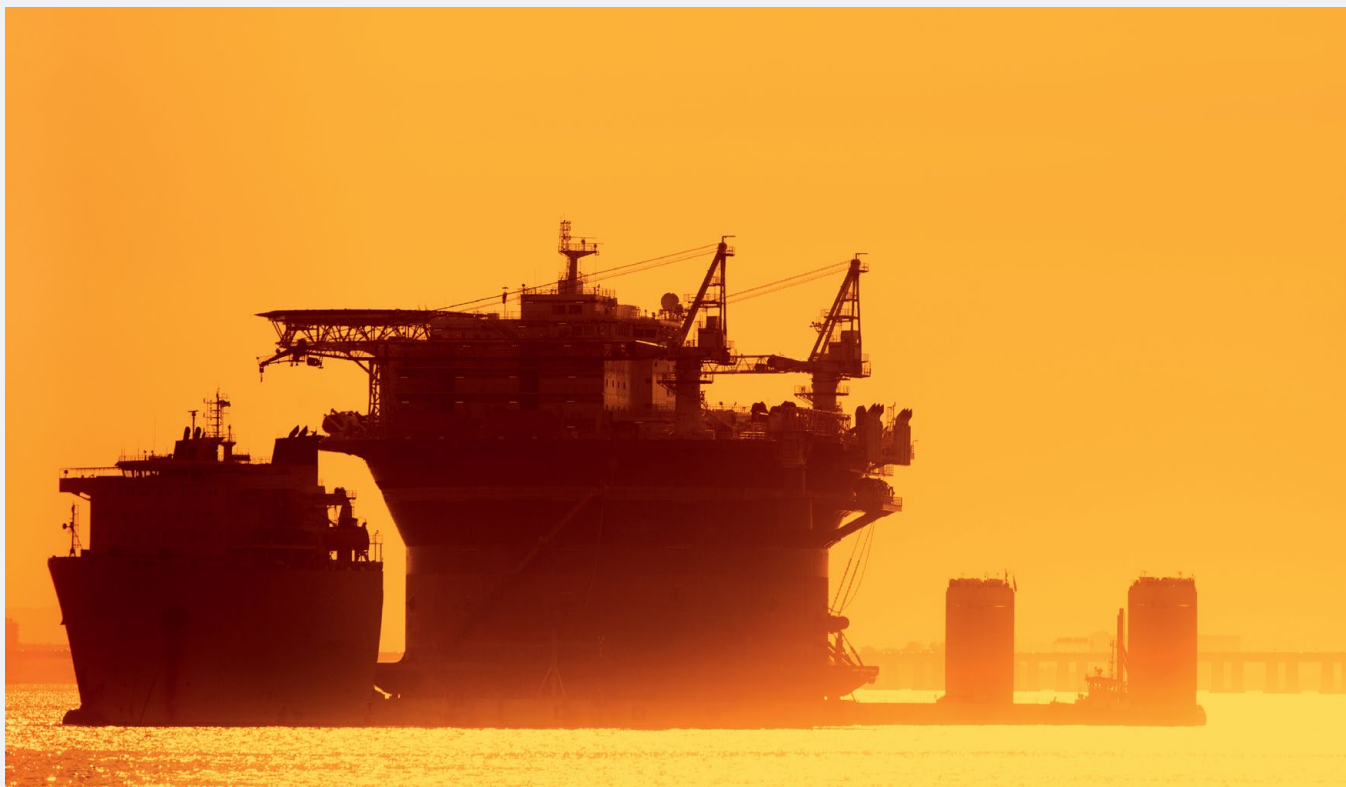
"But it all goes out over shared backhaul, which means you've got to hit that fine balancing point."

The company uses a number of SolarWinds modules in its network monitoring environment.

"We use the Network Configuration Manager (NCM) to make changes to our network devices, backup configurations and so on," Peczka said.

"We use the Network Traffic Analyzer (NTA) to get a feel for what's travelling over our network, to analyse how traffic is flowing, how links are performing, where our bottlenecks are and what's causing them.

"And we use the Network Performance Monitor (NPM), which sits on top of both of those products and provides the orchestration layer for want of a better term, as well as general monitoring and up/down alerting."



NTA, in particular, continued to prove valuable in tracing sources of congestion and detecting security threats.

"If we see conversations happening over unusual ports that can generate a red flag for us," Peczka said.

"We can work out whether it's malicious traffic or just something that's been misconfigured."

Peczka said that SolarWinds remains a "critical tool" for network monitoring and analysis in the company's environment.

"We're always looking for deeper visibility and information on what traffic is traversing our network and our links, and ways to make it better," Peczka said.

"The SolarWinds product suite we have at the moment and some of the other products they offer help us to do that."

Case Study

 TELSTRA

Neeraj Kumar Mishra is a technical subject matter expert on the Integrated Operations management toolset at Telstra. He's also a SolarWinds Certified Professional, although he isn't an end user of

the tools. "My role is more on setting up the SolarWinds application for the customers based on their requirements or offerings," Neeraj said.

Neeraj typically gets involved during the bid process for a customer account, scoping the proposed solution, costing it and – assuming all goes well – performing high- and low-level design and implementation.

Effectively, customers supply him with information on their environment and he maps their requirements into SolarWinds terminology.

"Also, my role is to configure the alarms so the Telstra Global Services NOC can view and act on the alarms," he said.

Some of the environments he has designed using SolarWinds are significant in scale. "In my current role the

maximum we have monitored is up to 60,000 devices," he said.

With a hand in so many SolarWinds implementations, he sees some consistent themes in what customers want specified in their deployments of the product.

"Every customer these days wants to see the network layer, the server layer, the application layer and the storage layer in SolarWinds," Neeraj said.

"One of the leading factors for SolarWinds is they now have a capability to show or monitor alerts on these four layers using different modules.

"They have different modules for different purposes but the main thing is a centralised console that gives a single view across all these four layers."

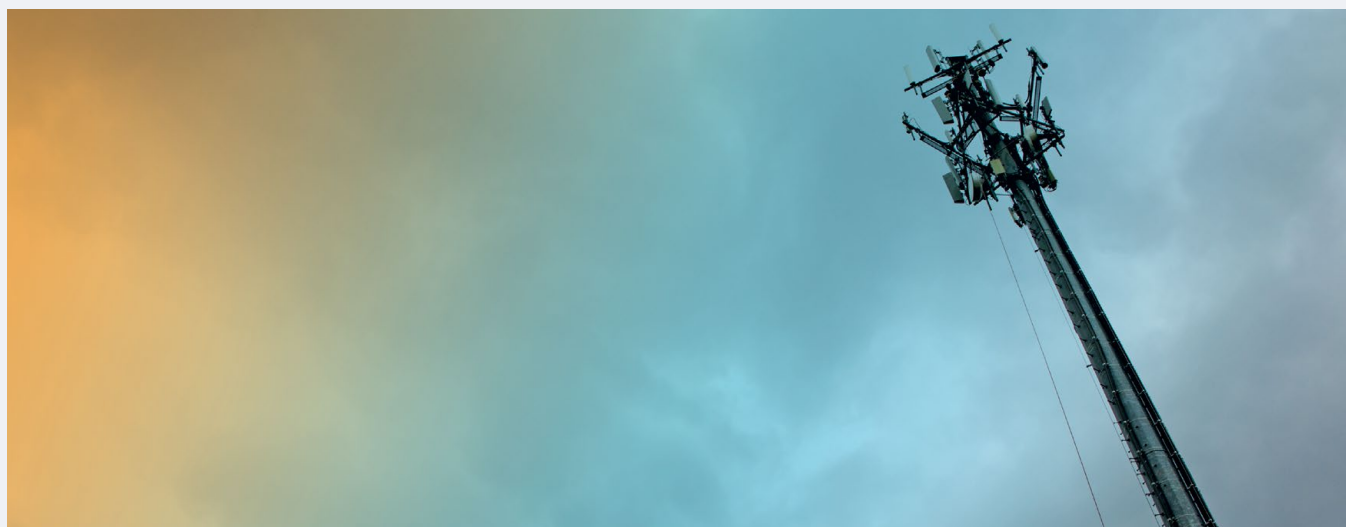
Most customers are also trying to monitor hybrid IT environments where infrastructure and applications are hosted on either side of the corporate firewall.

"It depends on the customer, but most customers these days have SaaS and the physical hosted environment to monitor," he said. "SolarWinds is a really good tool to monitor and alert in those environments."

Although Neeraj works with other tools, he has a soft spot for SolarWinds.

"SolarWinds is one of our favourite products," Neeraj said. "The reason is if you compare the pricing or cost of the product, it's very competitive in the market.

"If you go with other tools it's very costly compared to the level of features or capabilities which SolarWinds provides at a much more competitive price."



Feature



WHY THE NETWORK IS ON THE CXO RADAR

Networks are so ubiquitous and reliable that everyone expects to be online wherever they happen to be and whenever they'd like, regardless of time zones and whether tech support is available where they are located.

"The network is a commodity, not dissimilar to water or electricity," SolarWinds CTO/CIO Joel Dolisy said.

"Everyone just assumes if they're in a public area that there will be wi-fi, or that if they're in an office, the Ethernet plug in the wall is live, working and fast. It's like turning on a tap or plugging into an electrical socket."

While these user attitudes could be construed as positive – an indication, perhaps, that more operators are reaching the Five 9's holy grail of high availability than ever before – they could also come at a cost.

That cost, in simple terms, is this: Are commodity attitudes towards networking causing it to slip from the CXO radar?

Are CXOs so comfortable with the maturity of the network that they are focusing their strategic efforts and investment elsewhere?

Dolisy thinks this may be the case, and market revenue data appears to support that assertion.

IDC see enterprise switch spend tracking at around 1 percent growth, and Gartner predict network equipment spending growth of 3.2 percent this year.

While that's hardly an advertisement for networking's sway in the IT budget or strategy, these numbers might not be the best way to gauge the CXO mindset when it comes to the network.

Indeed, a January 2015 research note by Piper-Jaffray saw chief information officers (CIOs) cite networking as the area of the data centre most in need of a refresh. This is due to the transition from traditional 'dumb' networks to those that have application aware intelligence, software-defined networking (SDN) and the blending of software and application visibility into the core network infrastructure.

That may not yet be reflected in the investment numbers tracked by industry analysts, but it does confirm CXOs still recognise the network has business value to offer beyond day-to-day uptime.

That business value will become more apparent as the network underpins the realisation of several infrastructure evolutions.

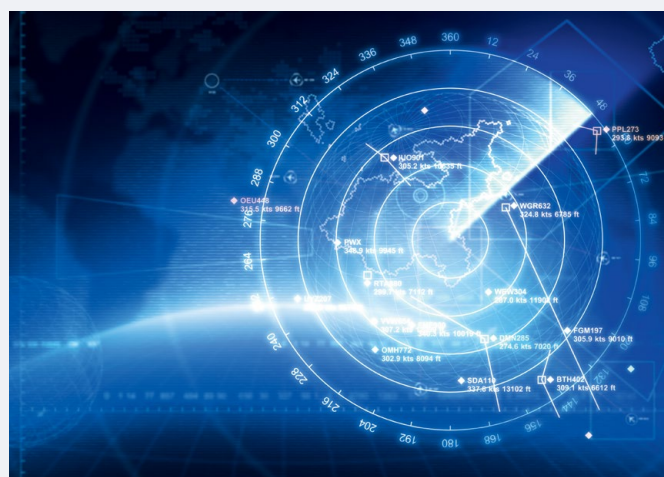
One evolution is the ongoing rise in complexity of the network as the number of endpoints and applications running over the network explode and the boundaries of the network expand.

CXOs that are embracing a hybrid on/off-premise or majority cloud-based operating model will already be familiar with this increased complexity and the importance of the underlying network in achieving that vision.

"We know CXOs are trying to wrestle with a long-term technology horizon around how to do these transitions to hybrid IT and cloud," SolarWinds senior vice president and general manager, Pacific region, John Rizzo said. (see breakout box opposite)

SolarWinds is making these types of transitions easier by providing much-needed intelligence and visibility into the performance of infrastructure and applications hosted either side of the corporate firewall.

By design, the tools also help CXOs keep a lid on growing complexity at a time when IT staffing levels aren't necessarily keeping pace.



"CXOs remain under pressure to do more with less," Rizzo said.

"The network is growing at a much faster rate than the number of people inside the company made available to manage and monitor it.

"There's got to be a technology solution. We've got to provide more automation to allow IT professionals to keep up."

AGILE THINKING

The company is also evolving its products to suit emerging ways of working – such as the push to apply agile methodologies to the IT operations domain.

That push is occurring primarily through the adoption of DevOps – a cultural movement to bring developers and operations closer.

DevOps-aligned engineers and system administrators are "to some degree a new set of constituents that are more focused on application performance management than we're used to dealing with," Rizzo said.

Here, the value of the network is in its ability to support rapid, iterative changes to the applications that run atop of it. Like all agile methodologies, the business value is in being able to move fast and adapt to changing requirements.

One side effect of DevOps is it drives CXOs to gain a deeper understanding and exposure into the network and applications stack – since both must work in sync to benefit the business.

This need for deeper understanding and visibility is driving SolarWinds' future direction and strategy.

"The question is: Do you need a different set of tools versus the one that you currently have, or do you need to make changes to the existing tools to make them more relevant to the new breed of IT operations people? I think the answer is really the latter," Dolisy said.

"Monitoring tools need to stay relevant to their audience. If their audience is seeing the world in a different way then we need to modify our tooling to reflect that change in perspective."

MONITORING THE CLOUD

With more customers wanting to monitor the performance of cloud infrastructure and applications using existing tools, SolarWinds has been investing to make it possible.

In the past year, SolarWinds has acquired Papertrail, Pingdom and Librato, all of which will be leveraged into SolarWinds' vision of a single pane of glass monitoring and management technology that works across any IT infrastructure deployment method.

"These three acquisitions provide us the foundation on which to connect the NPM platform into public cloud type services and then the data available on applications running there can be consolidated and plugged into the NPM," SolarWinds senior vice president and general manager, Pacific region, John Rizzo said.

With on-prem not going away any time soon, and cloud deployments moving at different rates depending on the customer and industry, the big question is whether SolarWinds plans to make cloud monitoring native in NPM, rather than continuing to connect into it.

"I think it's an interesting question, and honestly, we are still working on exactly what that means," CTO/CIO Joel Dolisy said.

"We know that the hybrid world is here because we are all experiencing it.

"We have applications that are straddling on-premise, cloud and SaaS components, so we need to be able to tie those things together."



Top Four



FOUR WAYS YOUR NETWORK COULD CHANGE IN THE NEXT FOUR YEARS

While network administrators are used to keeping the lights on, the time is approaching for a major change in the way networks look and run.

We track some of the top trends being talked about by SolarWinds customers and partners that could change the way you view the network by 2020:

1. MORE CONTEXT

Network administrators still spend a lot of time troubleshooting.

That this is still the case bothers SolarWinds CTO/CIO Joel Dolisy, who believes data could be better used to free up administrators' time.

"Applications hold a lot of data and a lot of context, it's just that they don't bubble it up to administrators like they could," he said.

"There's an opportunity in network monitoring and management for a tools provider to actually provide tools with better context that can help reduce the mean time to resolution of those problems."

Dolisy sees a future for administrators that is steeped in automated intelligence: where an emailed alert not only describes a present problem but also includes details of similar past incidents and recent configuration changes that could be related.

The end goal is one where the system becomes better at detecting problems, and can mine a knowledge base to arm the administrator with enough information to fix problems much faster.

2. PREDICTING AND CORRECTING PROBLEMS BEFORE THEY CAUSE USER ISSUES

If network management becomes more automated and more able to tap into a historical knowledge base when problems arise, it is not out of the question that

the same system be used to predict problems – before they occur.

"Customers are interested in the ability to have their systems effectively take care of themselves with a greater degree of automation," SolarWinds senior vice president and general manager, Pacific region, John Rizzo said.

"There is an emerging need for technology that distinguishes from simply alerting administrators to problems, to alerting, fixing and if you will predicting when an issue might occur."

3. NETWORK VIRTUALISATION

After several years in the wild, network virtualisation has turned a corner and is likely to see more widespread adoption, according to Dolisy.

Between software-defined networking (SDN), network function virtualisation (NFV) and virtual overlay technology like VMware NSX, customers are beginning proof-of-concepts in greater numbers.

The SDN market in Asia Pacific alone "will grow from \$6.2 million in 2013 to over \$1 billion by 2018," according to **analyst firm IDC**.

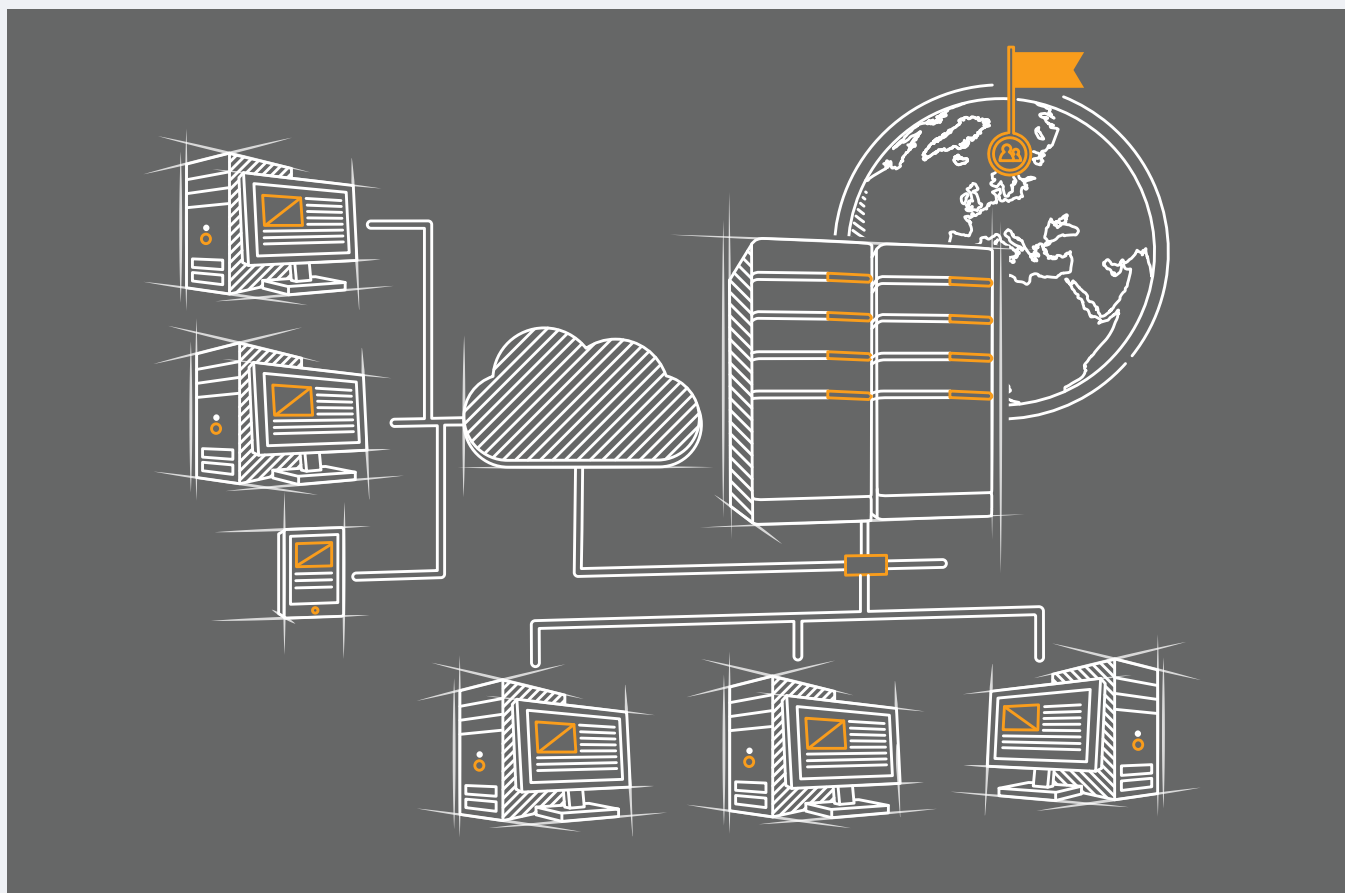
"People are talking about it," Dolisy said. "There's definitely more noise around this than there used to be."

Gartner notes one reason for recent customer movement – at least on SDN – is that misconceptions of its application only to large-scale networks are being overturned.

Dolisy believes network management and monitoring tools will also need to evolve.

"All tools that make up that portfolio of network management need to be aware of the construct of what network virtualisation is and the specificities it brings," he said.

"There's a level of awareness that the tools will need to bring in to stay relevant in this more hybrid and software-defined world."



4. THE RISE OF EDGE PROCESSING

The Internet of Things (IoT) peaked on Gartner's hype cycle for emerging technologies in mid-2014.

While definitions vary, the concept of IoT is really about connecting and networking unconventional things and turning them into data collection points. Think everything from sensors in rice fields and on oysters to connected cars and home appliances.

A lot of these 'things' are testing where we might consider the boundaries of the network edge to be – and where that data processing needs to take place.

"With the scale of IoT, it's not possible to get everything completely centralised, so there's a natural tendency to make processing more decentralised and push it to the edge," Dolisy said.

"I think it's a fine model, but if you look at technology trends in general, you've got this pendulum going from centralised to distributed back to centralised going back to distributed. I think the answer probably lies in the middle."

A recent survey of 200 Australian IT professionals by SolarWinds found IoT would bring "significant complexity" to network structures over the next 3-5 years.

Dolisy recommended building internal capability – staff and technology – to "maintain visibility over the growing number of connected devices".

WORKING TOWARD AN IoT FUTURE

While there is much hype around innovative use cases for the Internet of Things, administrators worry about the impact it will have on their ability to stay on top of network management.

A recent survey of 200 Australian businesses by SolarWinds found 77 percent believe IoT will make the task of network management more complex.

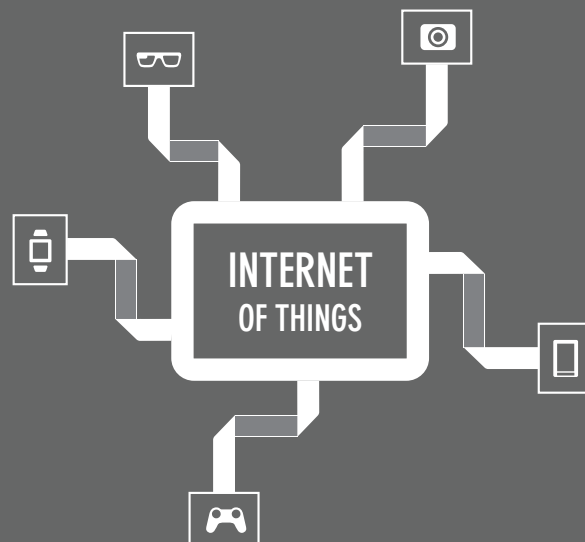
With so many devices out in the field - pushing the boundaries of the traditional network 'edge' - security is of particular concern.

More than half of respondents believed security was essential to overall network management in an IoT environment, followed by network monitoring and management capability (39 percent) and IP address automation (32 percent).

Respondents believed managing IoT would require a different set of skills to those typically held by network managers today.

Almost 75 percent of respondents felt their workforce was presently ill-equipped to tackle IoT projects today.

SolarWinds recommends a mix of training and investment in tools that can strip some of the complexity out of managing extremely distributed environments.



3 FREE TOOLS

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NETWORKING

BY THE NUMBERS

35%

The proportion of CIOs looking to refresh their network this year (up from 26% a year ago).

(PiperJaffray, 2015)

17%

of enterprises will open their wallets for application performance monitoring/management this year.

(451 Research, 2014)

88%

The proportion of CIOs that will increase spending on network security this year.

(PiperJaffray, 2015)

23%

of enterprises plan to increase spending on network performance management in 2015.

(451 Research, 2014)

\$1 BILLION

What the Application Performance Management (APM) market is already worth.

(Ovum, 2014)

25%

of Global 2000 organisations – of which there are 34 in Australia – predicted to take up DevOps by 2016.

(Gartner, 2015)

\$1.1 BILLION

What the Network Performance Monitoring and Diagnostics market is worth today.

(Gartner, 2015)

\$4.3 BILLION

What APM will be worth by 2018, buoyed by a compound annual growth rate of 12% a year.

(IDC, 2014)

\$6.2 MILLION

What software-defined networking brought in in 2013.

(IDC, 2015)

\$3.56 BILLION

What the Network Management Software and Appliance market is expected to be worth in 2018.

(IDC, 2014)

\$7.19 BILLION

What APM is predicted to be worth in 2020.

(Frost, 2014)

\$1 BILLION

Where software-defined networking will be by 2018.

(IDC, 2015)

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