

Heavy Strategy Podcast: AI, Automation, and Self-Healing Networks

Highlights with Audio Link

Johna Till Johnson, CEO of Nemertes and John Burke, CTO of Nemertes lead a conversation with Charlotte Patrick, an Independent Analyst and Dale Skeen, Founder and CTO of Vitria Technologies on Self-Healing Networks and Intelligence Architecture



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“Self-healing networks is not about saving headcount it’s about doing things that couldn’t be done before.”

Johna Till Johnson, Nemertes

AUTONOMOUS NETWORKS

Autonomous networks are self-managed with no human intervention. They can fully adapt and respond to situations without human input. Semi or highly autonomous networks deliver closed-loop automation with simple or multi-agent systems with varying degrees of human intervention. Highly autonomous networks make decisions largely independently.

Self-healing, autonomous networks are endless closed loops. When an agent completes an action, there is a closed loop to understand its effectiveness and the decision is placed in memory to improve future decision makings. New closed loops then check to see if the task is completed and the issue fixed; if not, setting off a new cycle of cause identification and resolution.

DEPLOYMENT TRENDS

AI/ML obviously plays a crucial role in self-healing networks. There has been strong focus on leveraging AI/ML in the automation of trouble shooting and service assurance. With automated root cause analysis being the most prominent activity in the last few years.

Fix recommendations and automating remedial action is the next area to move forward in the journey to a self-healing, autonomous network. Dale Skeen stated, “The purpose of AIOps is to troubleshoot, diagnose, and help automate fixing problems.”

He gave an example of AIOps used to solve a cell tower outage. “With a cell tower, you don’t know if it’s down or if a fiber is cut somewhere. AIOps checks to see if you can talk to other cell towers. Then, the entire situation is reviewed, a root cause is predicted and a recommended fix applied. If there’s an automation in place, it’s called up and applied. If the automation fixes the problem, then you know the right problem was detected, the right root cause identified, and you have the right fix. This now becomes a closed loop. You record it and feed it back into the AI, which reinforces what’s already learned. If the wrong decision was made, adjustments are needed.”

Johna Tilly asked, “But how long do you wait to see if it was the right fix?” Dale responded by explaining that, in the example above you verify by pinging the cell tower to see if it’s up.

What about the most important (and potentially irreversible) actions? In the case of irreversible actions, you place a human in the loop. Dale explained that typically there is an automatic classification that rates the risk and impact of a particular remediation and if the impact is high, the risk is too high and human-decisioning is involved. Additional safety measures are then in place, aiming to create a level of certainty before a human is then removed from the loop.

Dale emphasized the importance of having a measurable ROI in building and implementing automation. One of Vitria’s clients started by automating the low hanging fruit -- rebooting systems.

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And they were able, in about 60 days, to reach a 20% automation level. This gave their team 20% more time to focus on the real issues, the real difficult problems.

CREATING AN INTELLIGENCE ARCHITECTURE TO SUPPORT A SELF-HEALING NETWORK

Charlotte Patrick explained the four key components of an Intelligence Architecture.

- **Data:** Gather, federate, and use of data for training models and their use.
- **Intelligence:** Develop models to improve RCA performance and KPIs. For complex self-healing problems for a service, this will likely need to be centralized.
- **Knowledge:** Federate and organize knowledge that is about the network, services, devices and other elements, their descriptions and the relationships between them.
- **Agents:** Agents offer orchestration capabilities initially but will interact to solve problems or achieve specific goals as intelligence becomes more distributed. They will then inform downstream actuators to alert humans or orchestrate remediation.

Discussing what is new about intelligence architectures, Dale explained that "Over the past 20 years, we've focused on data and better ways and more scalable ways of processing data. Now the focus is on intelligence and more scalable ways of processing the knowledge or the metadata that intelligence needs. And to do that at scale. It's a fundamental change."

IMPORTANCE OF GOVERNANCE

Dale highlighted the importance of progressing governance at the same pace as automation. A set of governance

preprocesses need be in place and continuously monitored to stop inappropriate or bad behavior. When AI and large language models are used, should they be isolated in the environment? Should they be connected to the network at large? Should there be a human in the loop for what is considered high risk behavior for a certain amount of time before you allow the automation?

It's recommended to list the possible automated actions that can be taken, flagging the ones that need some degree of oversight and then associating those actions with the appropriate degree of oversight.

THE VALUE OF INTELLIGENCE ARCHITECTURE

Network systems are getting so complex that human operators struggle to keep up with them. To continue to evolve the network complexity there must be more control, automation, and governance. Skilled people are becoming scarce which furthers the need for more automation.

As Johna Till Johnson summarized: "It's not about saving headcount, it's about doing stuff that was flat out impossible to do before. It's like saying, oh, how many people can an x-ray machine replace? Well, none and a billion. You couldn't do that before, now you can do it. That is tremendously valuable. How many people does the internet replace? Well, none and a trillion. And anything that's truly disruptive simply stops being measurable in headcount and is only measurable based on what can be done that couldn't be done before."

LISTEN TO THE FULL PODCAST DISCUSSION

Recent research summarized in "[The Journey to a Self-Healing Network: Intelligence, Agents and Complexity](#)" may also be of interest.

ABOUT VIA AIOPS

VIA AI powers VIA AIops to deliver the process automation capabilities required to transform operations and dramatically lower cost. VIA delivers intelligent automation from a powerful platform that combines AI, analytics, and machine learning in real time. VIA provides Telcos with a modern operating model that enables a superior customer experience and supports a leaner, more efficient, and effective operations staff.

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