

## Highlights

- Unleash IT agility by eliminating cross-domain service provisioning, troubleshooting, and remediation delays
- Achieve end-to-end IT workflow automation that integrates tool chains and processes from other IT domains
- Reduce time-to-value and time-to-resolution with Extreme Networks turnkey network lifecycle automation suites specifically designed, built, and tested for Extreme Networks
- Leverage the power of DevOps methodologies and popular open-source technologies that embrace industry best practices and a thriving technical community for peer collaboration and innovation



## Extreme Workflow Composer

Powered by StackStorm

### Cross-Domain, DevOps-Inspired Automation for IT Operations

To unleash new levels of business innovation and competitive advantage, customers are embracing digital transformation. Success depends on building an agile business, and in the digital era, IT agility is unachievable without centralized, cross-domain automation.

Today, most IT organizations are addressing agility challenges through “integrated” solutions with proprietary embedded automation or through “opportunistic” automation that is specific to individual problems or projects.

However, according to Gartner research this approach introduces “islands of automation” that create complexity and increase costs and maintenance challenges. Additionally, with 66 percent of IT organizations aspiring to emulate successful cloud provider architectures, automation, and agility,<sup>1</sup> it is clear that the operational model must transform.

The way to undertake this transformation is through a centralized approach to automation that is DevOps-inspired and cross-domain to allow individual IT domains to use preferred tools while still enabling them to participate in the overall IT services delivery tool chains and processes.

<sup>1</sup> ESG Research Report, Data Center Networking Trends, February 2016.

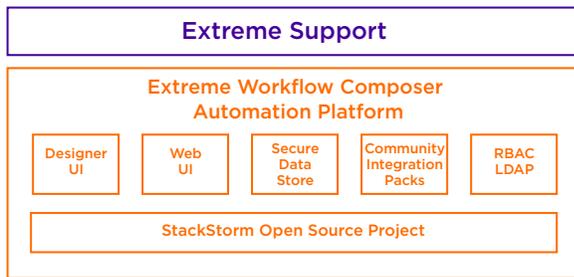


Figure 1: The Workflow Composer architecture.

Workflow Composer™, powered by StackStorm and its nearly 2,000 pre-built points of integration, is a DevOps-inspired event-driven automation platform designed to address these requirements. Workflow Composer is based on DevOps methodologies and common open source technologies to enable cross-domain workflows and straightforward integration with disparate IT technologies, platforms, and policies for providing split-second, reliable execution of service provisioning and remediation.

Workflow Composer features a componentized architecture with tools such as:

- A Graphical User Interface (GUI) designed to easily create workflows
- A Web UI for organizing workflows, defining rules, executing actions, and debugging
- A secure data store for storing environmental information
- StackStorm Community integration packs for cross-domain technologies
- Role-Based Access Control (RBAC) and Lightweight Directory Access Protocol (LDAP) support for enterprise-grade security and control

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*“Workflows have emerged as a fundamental part of the operational wiring at companies such as AWS, Facebook, and LinkedIn.”<sup>2</sup>*

**Dmitri Zemine**

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## Cross-Domain Workflow-Centric Automation

Organizations that have embraced DevOps methodologies understand that business agility cannot be achieved simply by automating and orchestrating one domain within the services delivery chain. When operating in functional silos (such as network, compute, storage, and applications), execution of tasks that span multiple domains can take days or weeks.

To optimize the delivery of services and infrastructure quickly, reliably, and repeatedly, the domains must be stitched together programmatically to ensure that the delay in transition of work from one function to another is minimized. The Workflow Composer uses two principles to address this challenge: workflows and cross-domain integration.

Workflows are a proven mechanism for converting manual operations and business rules into IT services delivery at scale. By enabling operators to separate the required tasks from the hardwired code, the tasks and operations policies become simple to define, visualize, and change. Workflows can be single-domain, such as provisioning a network device or application, or they can be cross-domain, such as detecting a service outage and automatically creating and assigning a help desk ticket to an operator.

Cross-domain integration enables disparate technologies (such as CRM and monitoring tools) and platforms (such as network, compute, storage, and cloud) to operate in a coordinated, intelligent, and automated way.

For cross-domain workflow automation to be successful, it must be able to both take inputs from and request changes on network devices or other cross-domain platforms and applications. Workflow Composer achieves this by using customizable sensors and actions pioneered by StackStorm.

Sensors are inbound integration points that watch for specific events from external systems. When an event occurs, it triggers the corresponding workflow based upon pre-defined rules and If This, Then That (IFTTT) logic. Actions are outbound integration points that execute

<sup>2</sup> Dmitri Zemine, “The Return of Workflows,” <http://devops.com/2015/04/09/return-workflows>.

commands on external systems. These actions are invoked either by users via a GUI, a Command-Line Interface (CLI), or by workflows (see Figure 2).

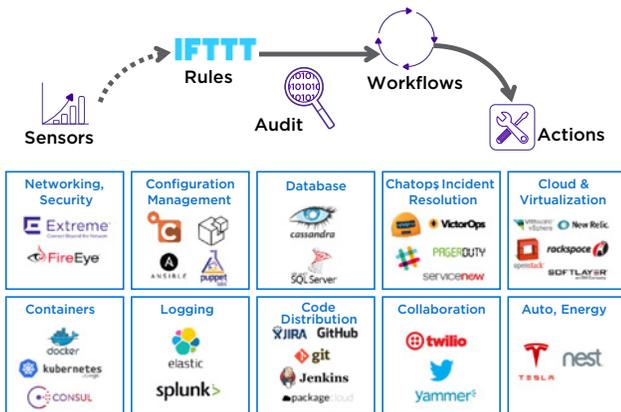


Figure 2: Streamlining operations across domains

With this unique, open, and customizable approach, workflows can respond to events and execute actions in a programmatic way on any network device, cross-domain platform, or application.

This will be especially crucial in the future; according to IDC, “By 2018, enterprises will double the size of their software development teams in support of digital transformation. Code will be essential—and the fastest-moving—vehicle for delivering competitive advantage.”<sup>3</sup>

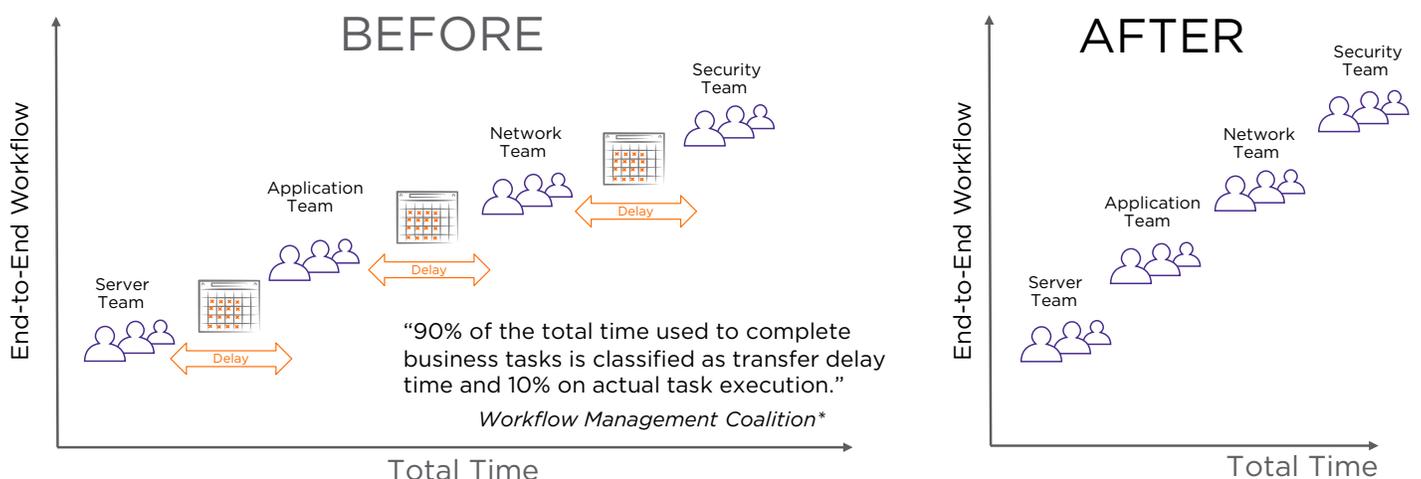
Workflow Composer eliminates cross-domain transfer delays to reduce task execution from weeks or days to seconds. The advantages of cross-domain integration are illustrated in Figure 3.

“Event-driven provisioning and network automation within the cloud stack is a crucial piece of our service offering to meet the complex demands of enterprise cloud systems.”

**Travis Mims, Vice President of Engineering at Cloud Automation Solutions**

### DevOps-Inspired

Workflow Composer promotes peer collaboration and innovation by leveraging the power of DevOps methodologies, popular open source technologies, industry best practices, and a thriving community. Based on the proven StackStorm Open Source Project and the use of common open source tools such as Python and Mistral, Workflow Composer users can leverage a community of like-minded peers for support, shared knowledge, and sources of inspiration and innovation. And the use of these languages, tools, and technologies further eases the transition into automation and opens access to a rich ecosystem of innovation.



\* Oracle - Understanding Workflows: ([https://docs.oracle.com/cd/E17984\\_01/doc.898/e14729/understand\\_workflow.htm](https://docs.oracle.com/cd/E17984_01/doc.898/e14729/understand_workflow.htm))

Figure 3: Eliminating cross-domain execution latency.

<sup>3</sup> IDC Source: IDC Futurescape: Worldwide IT Industry 2016 Predictions - Leading Digital Transformation to Scale -November 2015

**Powered by Stackstorm.** Workflow Composer leverages the StackStorm event-driven automation platform to provide cross-domain workflow automation. This free open source project has a growing community of users and contributors. To date, StackStorm provides nearly 2,000 points of integration with commonly used platforms such as Amazon, Azure, VMware, Docker, and OpenStack. To learn more about the StackStorm open source project, supported integrations, the StackStorm community, or to download StackStorm, visit [www.stackstorm.com](http://www.stackstorm.com).

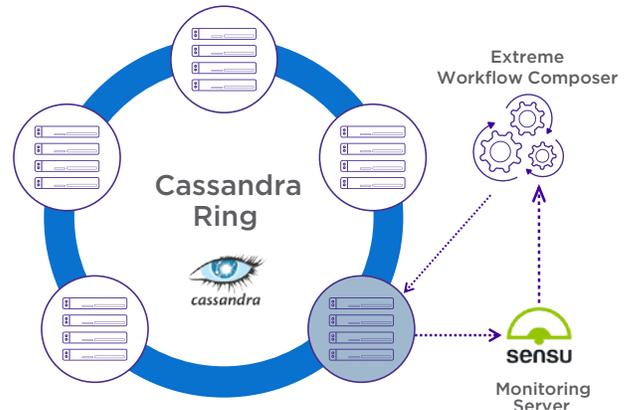


Figure 4: Remediation example with the Cassandra database.

## Examples and Benefits of Cross-Domain Automation

Workflow Composer includes nearly 2,000 customizable points of integration for popular platforms and IT applications so any IT organization can implement automation quickly. The following example illustrates an automated remediation workflow for addressing an issue involving a problem with a server in a Cassandra ring.

Initially, a node in the blue Cassandra ring in the lower right goes down. At this point, the status of the ring is still operational, but the ring's health is degraded.

A monitoring service (in this case, Sensu) detects the node failure and triggers a Workflow Composer remediation workflow to "Replace a Host."

The remediation workflow takes the following actions:

- Detect seed host state (the starting point for the nodes in the cluster)
- Spin up a new VM (in the node where a VM has crashed)
- Install Cassandra into the new VM
- Join the node to the existing Cassandra ring
- Ensure that the node is online in the ring

Table 2 shows additional examples of these points of integration and their benefits.

Use Case	Point of Integration	Benefit
<b>Monitoring:</b> Managing Alerts through ChatOps	SolarWinds, PagerDuty	Eliminate the manual process of task creation and trouble ticketing, and enable auto-remediation.
<b>Cloud computing:</b> Collaboration through ChatOps	OpenStack, Slack	Consolidate running the command, getting the output, and analyzing the results in one window.
Automated remediation: Disk space cleanup	Nagios, Sensu, Slack, BMC, Ansible, Puppet	Save time and frees resources by cleaning up log files.
<b>Cluster resiliency:</b> Node failure auto-remediation	Atlas, Slack	Protect against the failure of critical infrastructure.
<b>Fabric reliability:</b> Link flap auto remediation	Splunk, SolarWinds	Prevent application timeouts in mission-critical networks.
<b>Resource management:</b> Cross-domain remediation	Nagios, Sensu, New Relic, VMware, Puppet, Chef	Wire alerts from multiple sources and remediation through multiple management systems through automation.

Table 2: Points of integration for various use cases and their benefits.

## Getting Started

The Workflow Composer runs on a Linux-based server and executes single-domain or cross-domain workflows from Extreme Networks or the community using popular open source technologies such as Python, Puppet, and Mistral to enable event-driven automation with cross-domain technologies and platforms.

The Workflow Composer Automation Suites leverage the Workflow Composer to provide complete turnkey network lifecycle automation to jumpstart automation initiatives and deliver shortened time-to-value. Designed, tested, and built for a Extreme Networks infrastructure ensures that organizations can quickly, easily, and confidently transition to network automation at their own pace.

## Learn More

For more information about integrated Workflow Composer, visit [www.extremenetworks.com](http://www.extremenetworks.com).



<http://www.extremenetworks.com/contact>

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