## Highlights

- Improves IT agility by automating the entire network lifecycle—including initial provisioning, configuration, validation, and troubleshooting/auto-remediation—with event-driven automation

- Improves business agility by integrating network automation with tool chains and processes from other IT domains for true end-to-end IT workflow automation

- Allows organizations to implement automation at their own pace with turnkey, customizable, or do-it-yourself network workflow automation, all supported in multivendor network environments

- Leverages the power of DevOps methodologies, popular open source technologies that embrace industry best practices, and a thriving technical community for collaboration and innovation
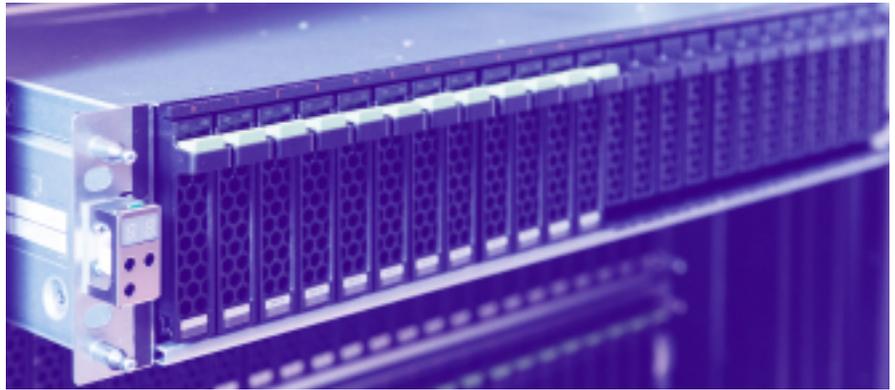
Extreme Workflow Composer

Powered by StackStorm

Improving IT and Business Agility Through Automated Network Operations

Unlike compute, storage, or application domains, network infrastructure continues to be a barrier to improving IT and business agility and transitioning to a digital business. But with 66 percent of IT organizations aspiring to emulate successful cloud provider architectures, automation, and agility, it is clear that the network and the operational model must transform.[1]
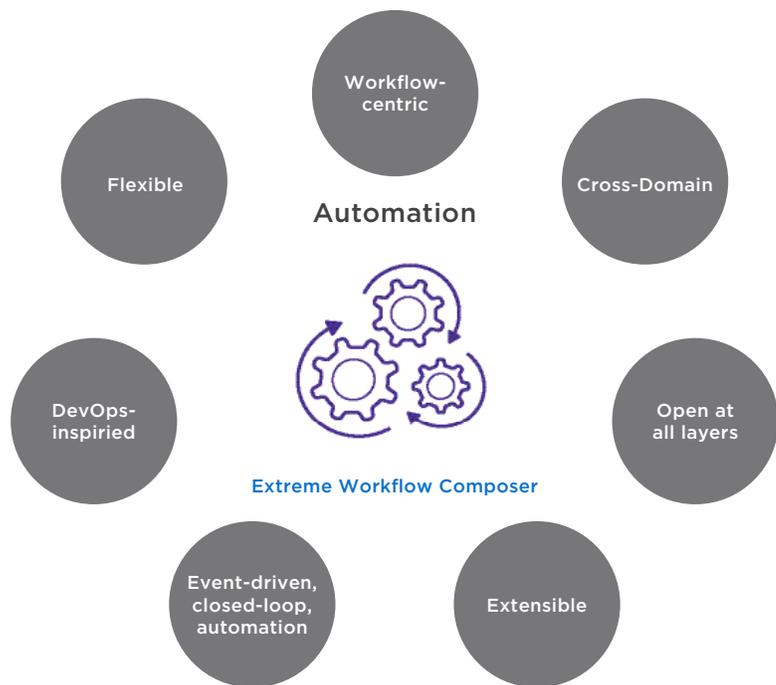
Figure 1 Workflow Composer design principles.

[1] Enterprise Strategy Group, ESG Research Report: Trends in Data Center Networking, February 2016.
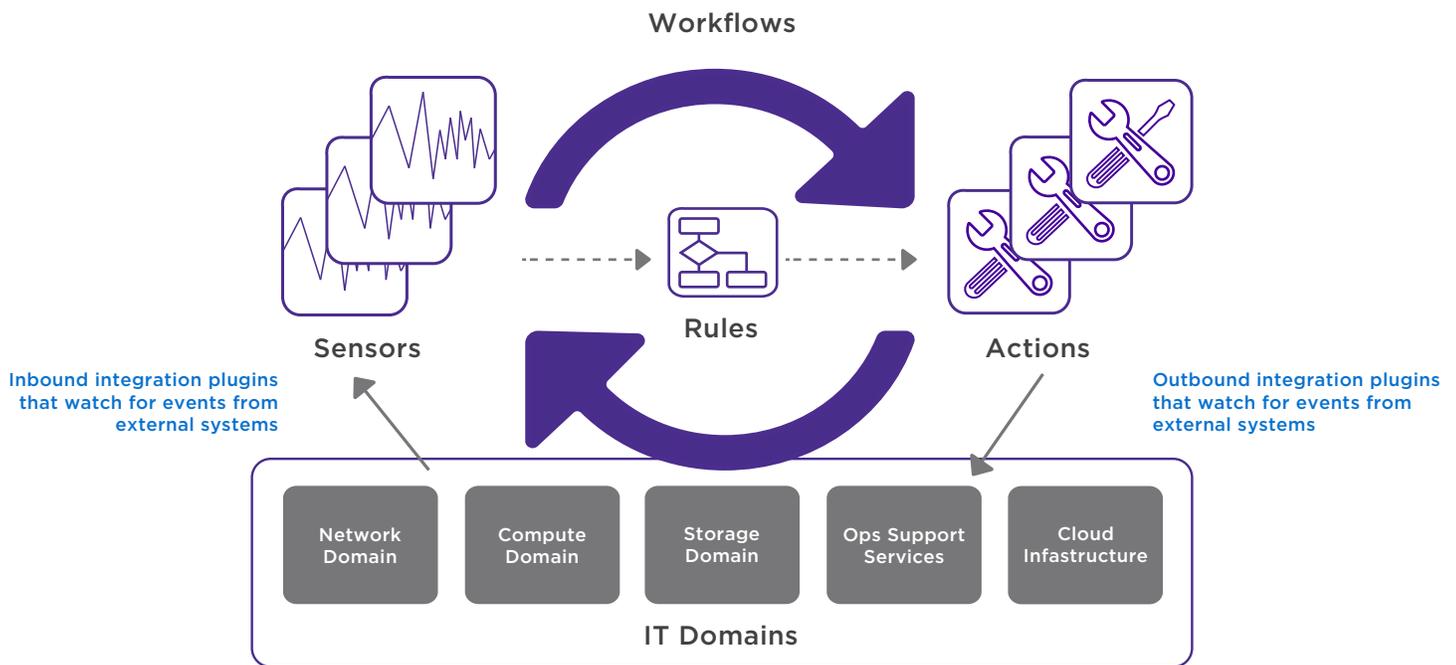
Figure 2 Anatomy of Workflow Composer.

For this to happen, organizations need a workflow-centric, cross-domain automation solution that leverages the power of DevOps methodologies, popular open source technologies, industry best practices, and a thriving technical community for peer collaboration and innovation. Workflow Composer is an automation platform built on the powerful and widely used StackStorm open source project. It is designed to automate the entire network lifecycle and enable cross-domain workflows to deliver split-second, cross-domain automation for improved IT and business agility.

Workflow-Centric Automation

To enable network lifecycle and cross-domain automation, organizations must think in terms of workflows.

A workflow is a series of steps and logic assembled and executed to accomplish a business or technical objective. More important, workflows are a proven mechanism for converting manual operations and business rules into IT services delivery at scale. They also can vary in complexity. Workflows can be single-domain, such as provisioning a network device or service, or they can be cross-domain, such as detecting a network device issue and automatically creating and assigning a help desk ticket if the issue cannot be resolved automatically.

Workflow Composer provides turnkey, customizable, or do-it-yourself workflow automation. Turnkey workflows ease the transition to automation by automating frequently performed tasks, such as provisioning and configuring an entire network fabric from scratch, adding a device to an existing network architecture, configuring BGP, validating a network configuration, or even troubleshooting common issues. Do-it-yourself workflows are created by organizations and executed through Workflow Composer to meet unique customer requirements, such as automating multivendor network platforms or other technologies.

Cross-Domain Workflow Automation Powered by StackStorm

Built on the StackStorm open source project, Workflow Composer can integrate with and automate cross-domain technologies to provide cross-domain workflow automation. The StackStorm open source project is an event-driven, cross-domain automation platform already in use by many mega-scale service providers and IT organizations.

Workflow Composer, leveraging StackStorm components and architecture, accomplishes this cross-domain integration by using customizable sensors and actions (see Figure 2).

Sensors and Actions

Sensors are inbound integration points that watch for specific events from external systems. When an event occurs, the sensor triggers the corresponding workflow based on rules. Rules also provide the ability to tie cross-domain workflows together. For example, when a new leaf switch registers, a sensor detects that event and then triggers the "Configure IP Fabric Leaf" workflow. Or, when a compute platform sensor detects storage capacity shrinking below thresholds, it triggers a remediation workflow to archive log files. Additionally, this sensor can trigger a Slack message to notify the user of the condition and that the condition has been remediated.

Actions are outbound integration points that request changes to external systems. Actions are invoked either by users via the Workflow Composer Admin UI, a Command Line Interface (CLI), a ChatOps window, or by workflows. For example, when a "Configure IP Fabric Leaf" workflow is run, it uses a Network Configuration Protocol (NETCONF) action to configure the IP, Border Gateway Protocol (BGP), and other settings on the switch.

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

Open at All Layers

Workflow Composer is open at all layers, enabling customization to meet unique requirements and to foster innovation and collaboration from the community and automation ecosystem (see Figure 3). At the top of the Workflow Composer architecture are turnkey workflows, which are open and customizable. Organizations can also choose to develop their own workflows from scratch. The Composable Services layer lists examples of the microservice-based framework that is at the heart of Workflow Composer. Each service is either openly accessible via APIs or open-sourced for greater extensibility. Finally, the Sensors and Actions layer represents the open points of integration provided by , StackStorm, or the community, and are needed to enable cross-domain workflow automation. With a highly extensible architecture that is open at all layers, the Workflow Composer automation platform can integrate with virtually any IT technology or platform.

Ordering Information

Workflow Composer comprises the Workflow Composer automation platform and, optionally, the various Automation Suites. The automation platform includes all required services, LDAP and RBAC security, the Web-based Admin UI for managing Workflow Composer components, and the Design UI for creating new workflow code using drag-and-drop methods. Workflow Composer Automation Suites, licensed separately, consist of any services, actions, sensors, and workflows required to provide turnkey functionality around common challenges, such as provisioning and maintaining a data center fabric. All automation suite components are engineered, documented, tested, and supported to work seamlessly with the Workflow Composer automation platform. And because Workflow Composer is open at all layers, all components are open and extensible to meet future requirements.

For more information about Workflow Composer Automation Suites, visit:
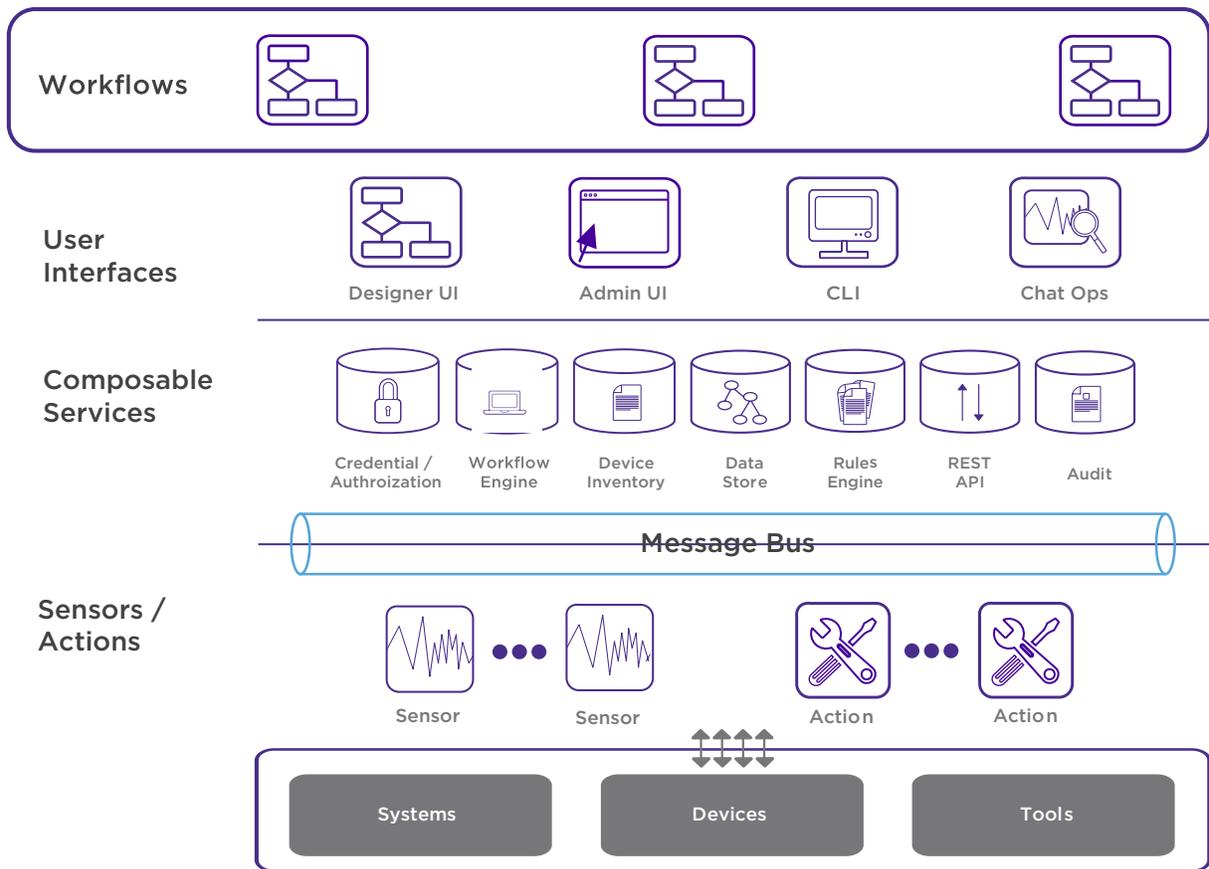www.extremenetworks.com/workflow-composer-automation-suites

Figure 3 The Workflow Composer architecture is open at all layers.

Workflow Composer Ordering Information

Part Number	Description
BR-BWC-ENT-S-02	One-year subscription for the Extreme Workflow Composer automation platform, per data center or admin domain. Includes LDAP, RBAC security, the Design UI, and Extreme Technical Support

Getting Started

Workflow Composer is available as a free 90-day evaluation. To download an evaluation copy, select the Free Trial option from www.extremenetworks.com/workflow-composer and follow the instructions.

Extreme Workflow Composer Specifications

Server Os	• RHEL 6.x, 7.x; CentOS 6.x, 7.x; Ubuntu 14.04, 16.04
Server Cpu	• Testing: 2×CPU cores • Production: 4×CPU cores
Server Memory	• Testing: 1 GB RAM • Production: >16 GB RAM
Server Storage	• Testing: 10 GB • Production: 40 GB
Programming Languages	• Puppet, Python, Mistral, Ansible, Ruby
Language Models And APIs	• YANG, NETCONF, YAML, REST

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