



# Infrastructure as Code

Digital transformation relies on fast and iterative application development which directly impacts business processes in order to make them more efficient, more customer or user oriented and ideally speed up business.

Deploying applications at a high pace requires dynamic infrastructure management which represents a real challenge where automation and software defined approaches are major pillars. The move from manual operations to Infrastructure as Code (IaC) represents a real transformation, from the technology to the implied workers as complementary skills are required.

Infrastructure automation takes advantage of reliable and consolidated data in a repository acting as the Source of Truth. The DDI (DNS-DHCP-IPAM) solution is the data foundation of automation and IaC initiatives. DDI provides all IP data mandatory to deploy, run and retire ephemeral infrastructures. It helps in the planning for massive deployments and, with the use of rich metadata and internal automation, can orchestrate many steps of the digitalisation processes.

## Solution Benefits

<b>SIMPLIFIED NETWORK MANAGEMENT</b>	IP data lake for simplified operations and automation
<b>BETTER AUTOMATION OF IT PROCESSES</b>	rich metadata providing multiple facets
<b>EASY ECOSYSTEM INTEGRATION</b>	simple-to-use open API and webhook
<b>OPERATIONAL TIME SAVINGS</b>	consolidated data repository for infrastructure programming
<b>COST SAVINGS DUE TO FASTER DEVELOPMENT</b>	DNS/DHCP service automation speeds up network coding

## Business Challenges

Organizations frequently develop software in cases where their applications contain specificities preventing them to be proposed as standard SaaS solutions. Systems engineers are used to developing scripts to ease their operations, but in network teams this is less common. The main challenge of process automation - for sustained rapid application development - is for I&O teams to first think of how to automate processes rather than trying to perform each action manually. It is a radical change in the culture and mindset which requires training, skills and processes. The criticality of network infrastructure often causes reluctance to automate, due to fear of losing control of processes and putting the network at risk.

As infrastructure is mandatory to modern application hosting for cost optimization, automatic scaling and multiple environments management, it is important to move in the automation and code direction.

When an operation is repeatable, infrastructure as code is a valuable concept to put in place. Easing infrastructure development, scripting, coding or using a high level configuration language needs valuable data as input, as well as a solution for storing all generated data.

Starting an automation journey can be seen as complex. It should not try to encompass every action but rather first focus on simple and repeatable ones, following the Pareto 80/20 principle. To ease the ramp up phase, a framework could be chosen and shared with all I&O teams in order to engage people, share the knowledge and apply good practices. Many solutions are available on the market, mostly open source based which eases getting support from the community and reuse of functional code. But very frequently data is key, so a strong repository brings significant value in the infrastructure as code process.

## Main Features of SOLIDserver DDI for IaC

The EfficientIP DDI IPAM is a repository of information related to the network world. It consolidates the IP addressing plan, technical information like VLAN and VRF, list of devices, list of networking equipment, list of applications, network users and more. This is why the IPAM is considered as the IP Source of Truth.

### Accurate dynamic data repository for automation

Acting as a central and reliable repository means data are always available and accurate. There should be systematic actions in all the infrastructure code to read information considered as truthful but also an easy way to add and update information in order to maintain the high level of data quality for the entire IT ecosystem. The ability of the IPAM module embedded in the SOLIDserver DDI solution to dynamically manage and store infrastructure data is a strong enabler for any automation coding initiatives.

The rich data lake proposed by the DDI solution can even be extended through open metadata that can be associated with any kind of object in order to bring new business or functional facets and eases automation. Finding an object in the DDI, thanks to metadata, therefore becomes more simple, as the powerful filtering mechanism reduces data set size for each operation. This rich data set enables numerous IT automation use cases.

### DDI integrated automation for simplified coding initiatives

In addition, the DDI automation directly available within the solution brings an easy and robust way to manage DNS records, network zoning, DHCP ranges and device pools. That simplifies considerably any new infrastructure development and eases ramping up the skills of the whole I&O team when coding is not in their nature.

Coding in the infrastructure does not need to be rigorous, it can be performed through simple scripting using a high level language or solution like Ansible or Terraform. It can be implemented in an interpreted language like Python or in more advanced system languages like Golang or Rust for more complex production workflows, performances or management rules. It can also use very accessible solutions like Rundeck to bring automated actions to operators and ease their day to day activities. Each time a new piece of software is developed or improved and used by I&O teams, time is freed up to improve the service and develop other parts of the automation. This is a virtuous circle.

### IP Data Repository open to the automation ecosystem

The SOLIDserver IPAM is easy to access from the ecosystem, most exchanges can be made through standard API and any action that can be taken through the GUI is also available through an API call. To allow quick development and test, the SOLIDserver ecosystem proposes several snippets, code examples and libraries for the most common languages in order to quickly develop infrastructure code and automate the initial processes.

In addition the embedded IPAM is very flexible and proposes multiple ways to interact with its ecosystem. It's not always a matter of exchanging data through the northbound API, sometimes the DDI solution needs to inform tools in the ecosystem for them to perform specific tasks on their own. This is why SOLIDserver also offers an event based framework allowing notifications to be pushed to peers, either through API calls or through an enterprise service bus implementing a publish/subscribe mechanism.

## Key Takeaways

Infrastructure as Code proposes a powerful way to improve efficiency for I&O teams by suppressing simple tasks and allowing time to be spent on higher value ones. Each manual action which is automated directly brings many benefits: reproducibility, execution quality, ability to be launched by anyone in the team, execution time control, easy troubleshooting and cost optimization.

Linking infrastructure code with the DDI data lake is mandatory for scalability and for allowing I&O teams to have more and more automated processes for their infrastructure components. This is a good way to start or continue the automation journey, with rock solid foundations on which infrastructure can operate and be adapted to help digital transformation of your organization.



As one of the world's fastest growing DDI vendors, EfficientIP helps organizations drive business efficiency through agile, secure and reliable network infrastructures. Our unified management framework for DNS-DHCP-IPAM (DDI) and network configurations ensures end-to-end visibility, consistency control and advanced automation. Additionally, our unique 360° DNS security solution protects data confidentiality and application access from anywhere at any time. Companies rely on us to help control the risks and reduce the complexity of challenges they face with modern key IT initiatives such as cloud applications, virtualization, and mobility. Institutions across a variety of industries and government sectors worldwide rely on our offerings to assure business continuity, reduce operating costs and increase the management efficiency of their network and security teams. Copyright © 2021 EfficientIP, SAS. All rights reserved. EfficientIP and SOLIDserver logo are trademarks or registered trademarks of EfficientIP SAS. All registered trademarks are property of their respective owners. EfficientIP assumes no responsibility for any inaccuracies in this document or for any obligation to update information in this document.

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