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# Zabbix Server-to-Server Replication

Dealing with multi-tenant multi-integration environments

# Background: New Customer Project

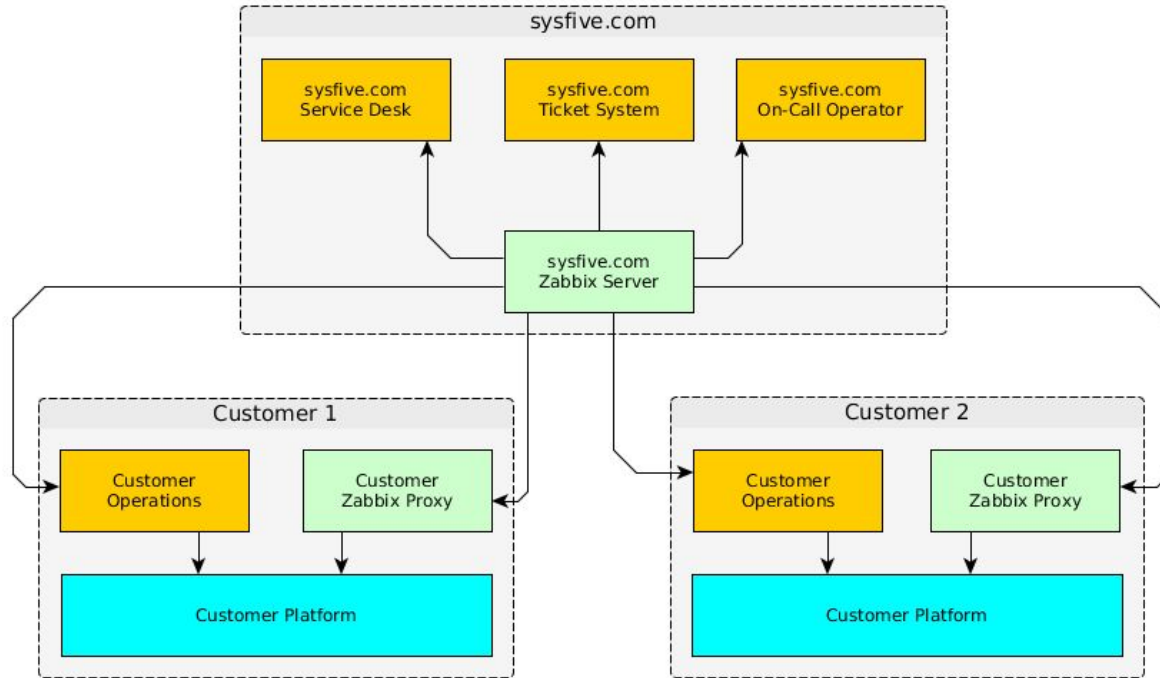


- Logistics company
- Own IT department
  - **Developing and operating their own business software**
  - **Several hundred employees on their own**
- sysfive.com tasks
  - **Log Monitoring (Elastic Stack)**
  - **Application Monitoring (Zabbix)**
  - **Application Server (Third-Level-Support)**

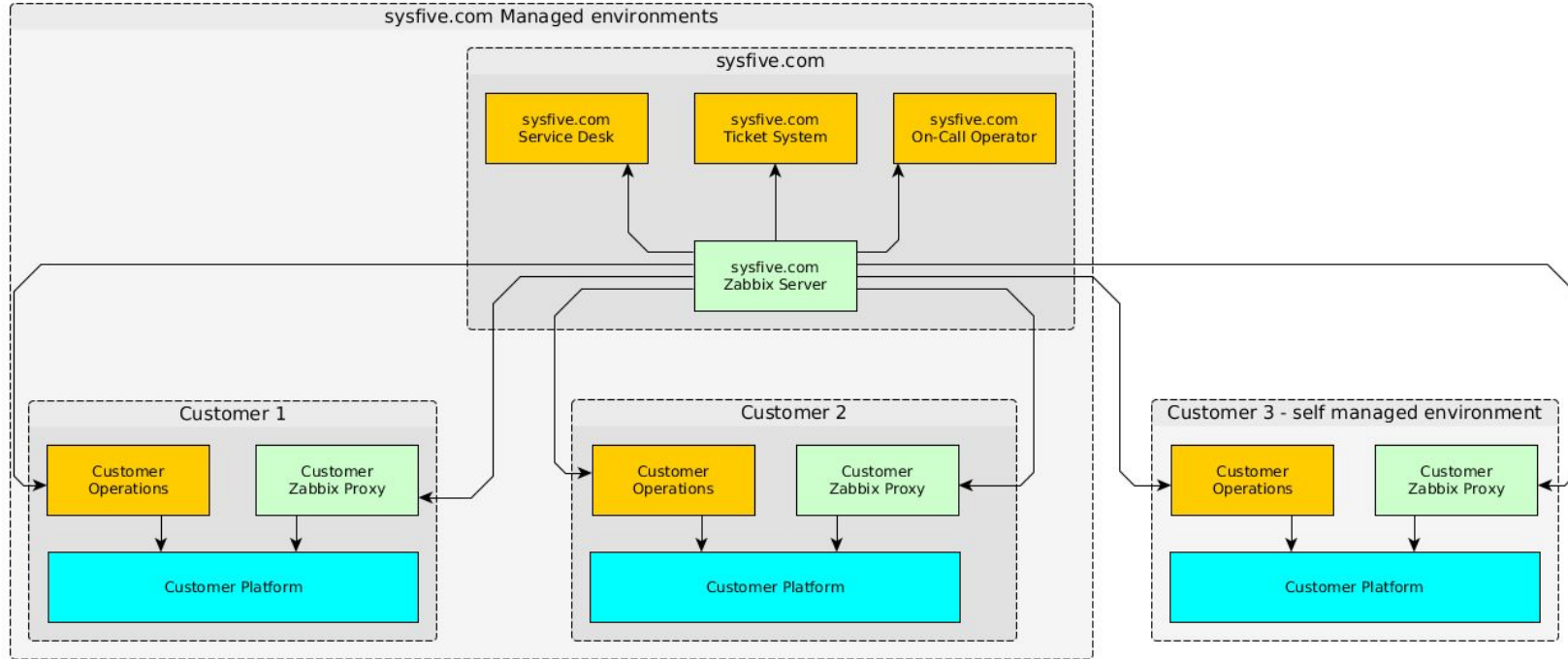
# Resulting problems

- Sysfive.com standard procedures
  - **Full platform operation**
  - **Centralised monitoring (one dashboard for Ops Team)**
  - **Integration of Monitoring with other tools**
- Special Customer Project
  - **Selection of services**
  - **Monitoring “as a service” for other teams**
  - **Providing monitoring servers at the customers site**
- Problems
  - **Both companies want to “own” the monitoring**
  - **Limited possibilities for integration with other sysfive Services**

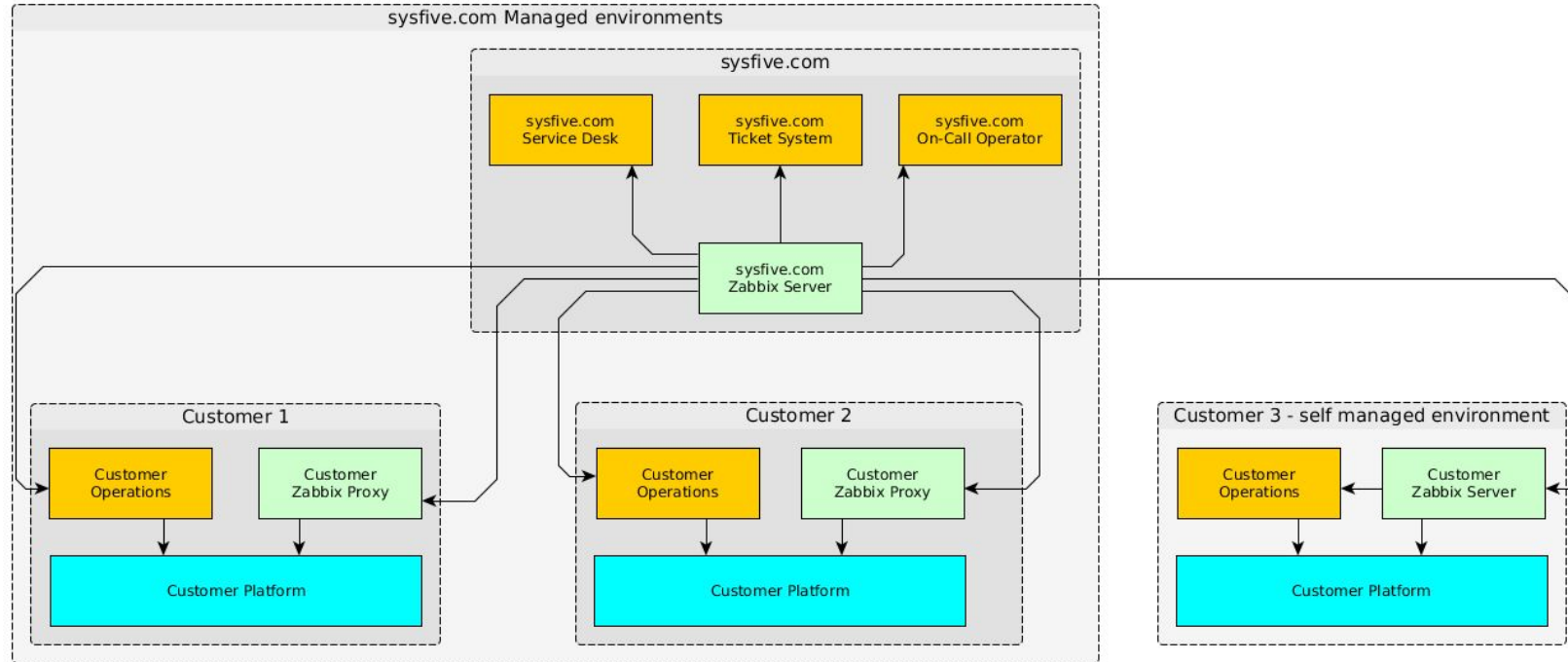
# Sysfive Infrastructure (so far)



# Expansion (rejected)

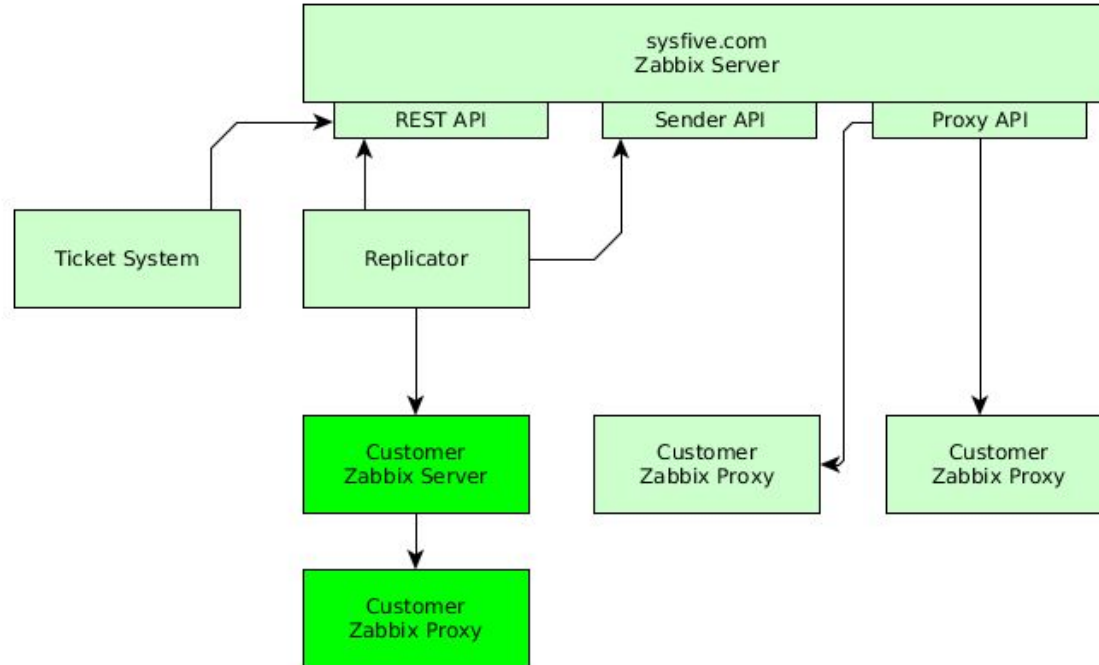


# Expansion using replication



- Server-to-Server-Replication!
  - **Receiver: sysfive Zabbix**
  - **Sender: customer's Zabbix**
    - Only limited access rights acceptable
  - **Replicate all data and necessary configuration**
    - Only item/trigger configuration
    - Only limited set of hosts
    - No templates etc, because no configuration done on Receiver
- Conclusion:
  - **We need a light-weight replicator that can run as an API read-only user**
  - **It has to run on the sysfive server that works as a “monitoring aggregator”**

# Solution





# Technical Solution

- Python Replication Script
  - **Based on “pyzabbix” module**
  - **Using a simple configuration file for connection + hosts**
  - **Automatically replicate wanted hosts (items & triggers)**
- Use only one Interface on Data Source
  - **Zabbix REST API**
- Use two interfaces on Receiver
  - **Zabbix REST API for configuration**
  - **Zabbix Sender API for monitoring data**
- Automatic conversions and creations
  - **All items become Trapper Items**
  - **Per Host a Replication Monitor Item+Trigger is created**
    - All replicated triggers depend on this

# Technical Solution



- Running as a cron job
- Uses an flock on the configuration to prevent “overrunning”
- Automatically detects which host configuration have to be replicated
- Local “replica cache” for efficient and fast replication (minimize API calls)
- <https://github.com/sysfivecom/zabbix-replicator>

# Limitations

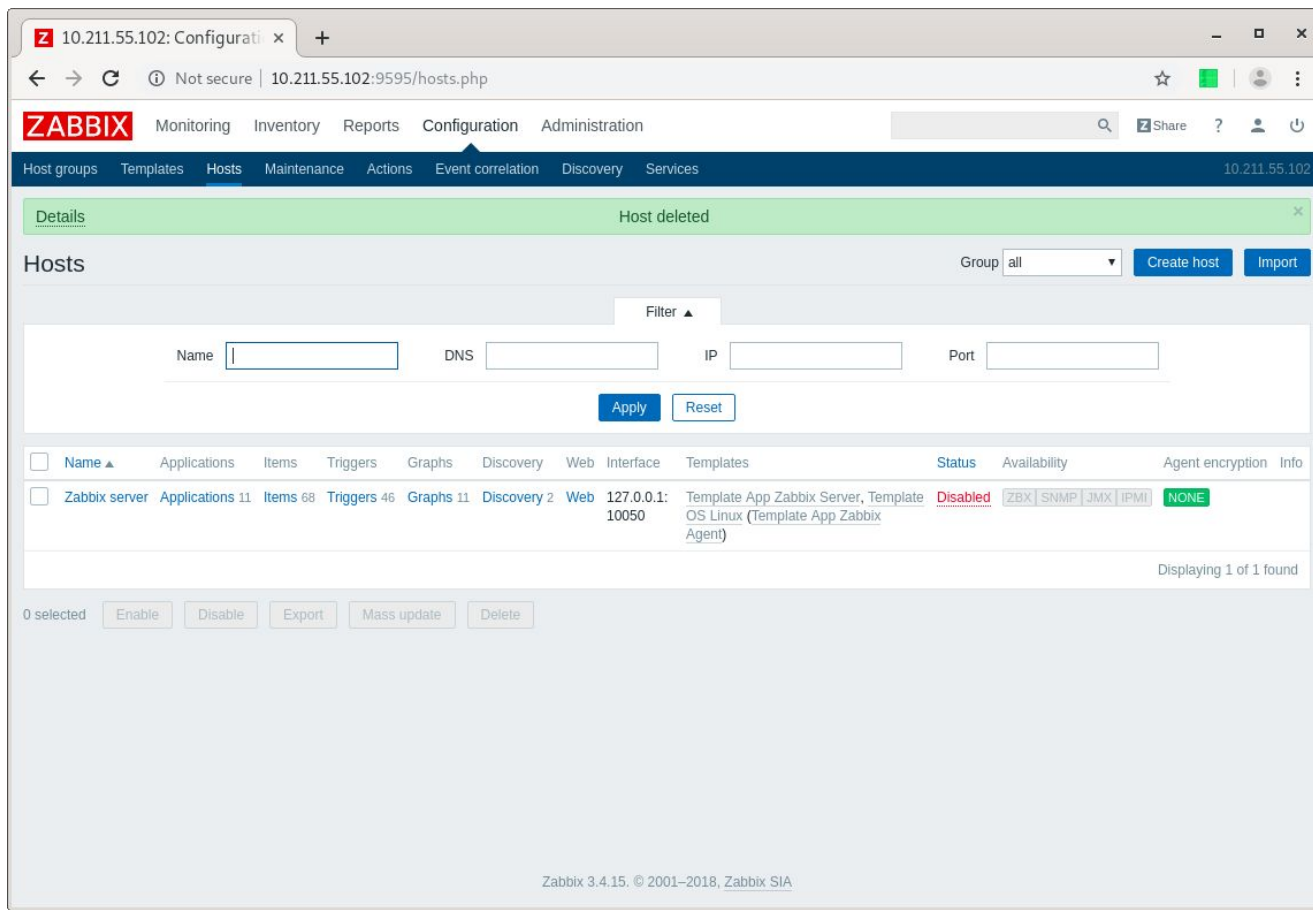
- Not running as a continuous service
- Not supporting replication of more types (Applications, Templates...)
  - **This could be added easily, if you need it, go for it!**
- Not automatically detecting changing configurations
  - **Need a forced replication of configurations at the moment**

# Demonstration



- No Real Data available
  - **Production system not yet implemented**
- Test setup
  - **Sysfive.com Zabbix Server as Source**
  - **Vagrant Zabbix Server as target**
  - **Replicate 12 Hosts**
- Demonstration Tasks
  - **Show initial replication**
  - **Show performance impact**

# Demonstration – Empty Target



The screenshot shows the Zabbix web interface in a browser window. The address bar shows the URL `10.211.55.102:9595/hosts.php`. The navigation menu includes **ZABBIX**, Monitoring, Inventory, Reports, Configuration, and Administration. The main navigation bar shows Host groups, Templates, Hosts, Maintenance, Actions, Event correlation, Discovery, and Services. A green notification banner at the top says "Host deleted".

The "Hosts" section is active, showing a search filter and a table of hosts. The filter fields are Name, DNS, IP, and Port. The table contains one host:

<input type="checkbox"/>	Name ▲	Applications	Items	Triggers	Graphs	Discovery	Web	Interface	Templates	Status	Availability	Agent encryption	Info
<input type="checkbox"/>	Zabbix server	Applications 11	Items 68	Triggers 46	Graphs 11	Discovery 2	Web	127.0.0.1:10050	Template App Zabbix Server, Template OS Linux (Template App Zabbix Agent)	Disabled	ZBX   SNMP   JMX   IPMI	NONE	

At the bottom of the table, it says "Displaying 1 of 1 found". Below the table are buttons for "0 selected", "Enable", "Disable", "Export", "Mass update", and "Delete".

Zabbix 3.4.15. © 2001–2018, Zabbix SIA

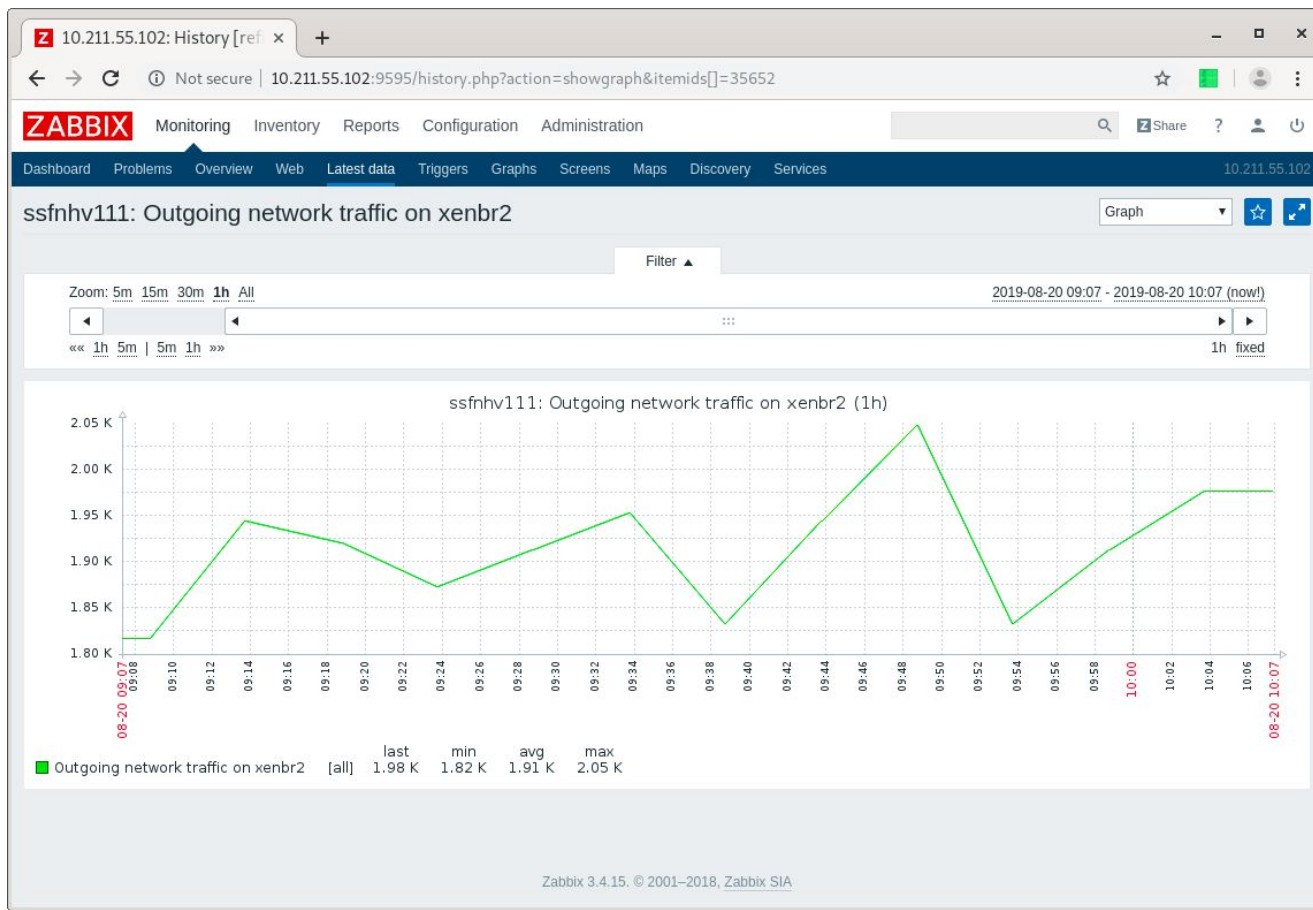
# Demonstration – 5min initial replication



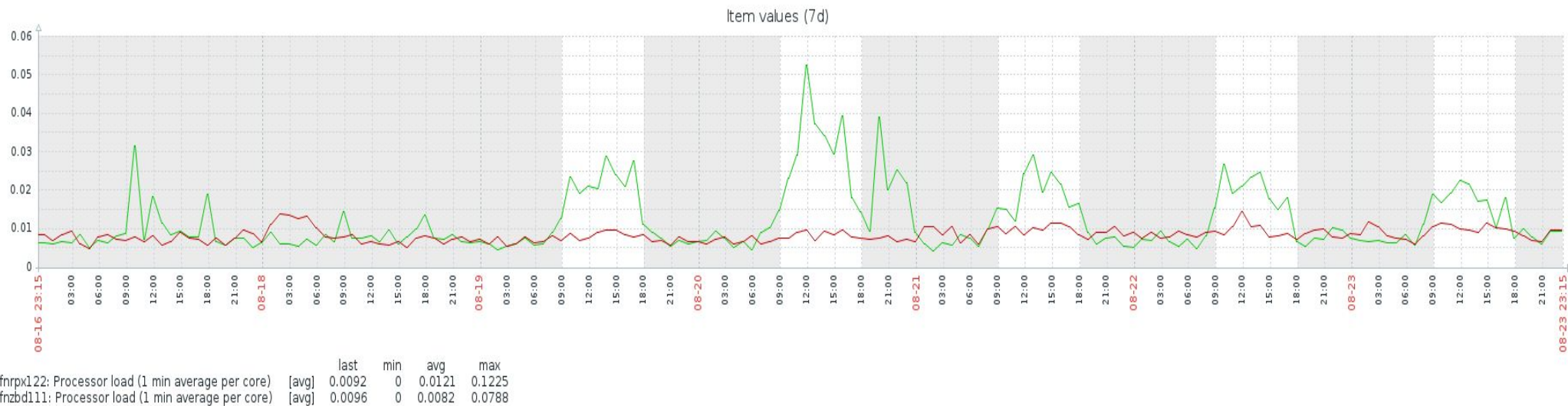
<input type="checkbox"/>	Name ▲	Applications	Items	Triggers	Graphs	Discovery	Web	Interface	Templates	Status	Availability	Agent encryption	Info
<input type="checkbox"/>	ssfnct111	Applications	Items 209	Triggers 102	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnct121	Applications	Items 201	Triggers 101	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv111	Applications	Items 116	Triggers 50	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv112	Applications	Items 181	Triggers 49	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv113	Applications	Items 165	Triggers 49	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv114	Applications	Items 124	Triggers 57	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv115	Applications	Items 118	Triggers 57	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv121	Applications	Items 122	Triggers 50	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv122	Applications	Items 121	Triggers 60	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv123	Applications	Items 129	Triggers 58	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv124	Applications	Items 130	Triggers 57	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	ssfnhv125	Applications	Items 103	Triggers 1	Graphs	Discovery	Web	127.0.0.1:10050		Enabled	ZBX   SNMP   JMX   IPMI	NONE	
<input type="checkbox"/>	Zabbix server	Applications 11	Items 68	Triggers 46	Graphs 11	Discovery 2	Web	127.0.0.1:10050	Template App Zabbix Server, Template OS Linux (Template App Zabbix Agent)	Disabled	ZBX   SNMP   JMX   IPMI	NONE	

Displaying 13 of 13 found

# Demonstration – 1h history per item



# Demonstration – Source Server Baseline

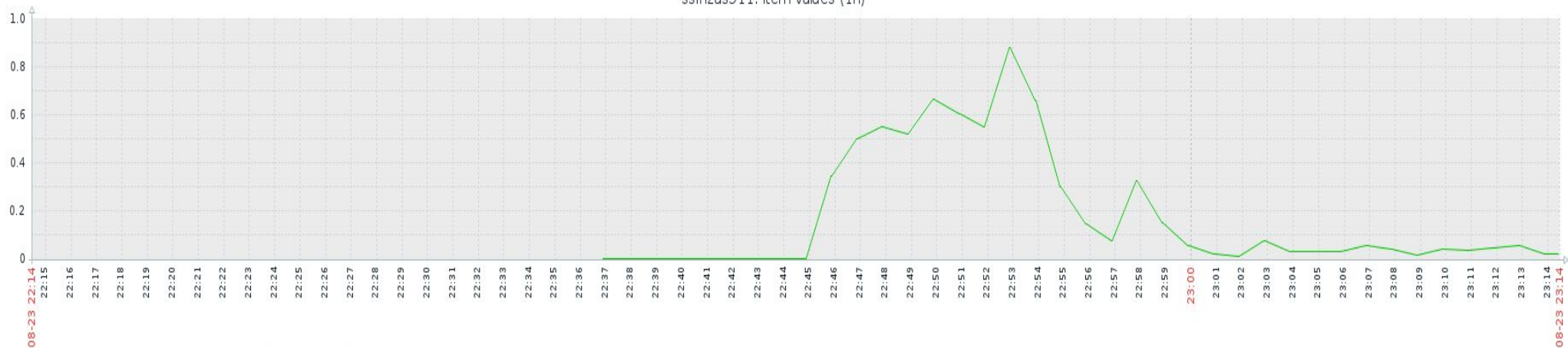




# Demonstration – Target Server Load

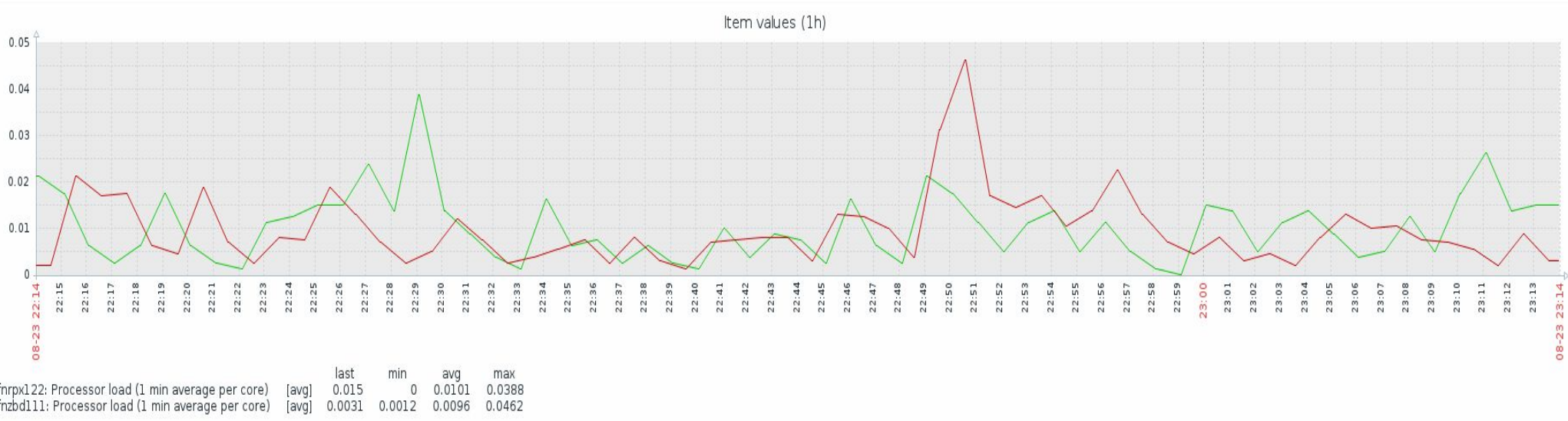


ssfznas911: Item values (1h)



■ Processor load (1 min average per core) [avg] 0.02 min 0 avg 0.1796 max 0.88

# Demonstration – Source Server Load



	last	min	avg	max
ssfnrpx122: Processor load (1 min average per core)	[avg] 0.015	0	0.0101	0.0388
ssfnzbd111: Processor load (1 min average per core)	[avg] 0.0031	0.0012	0.0096	0.0462

## Demonstration - Conclusion



- Initial Replication
  - **Very High Load on target**
  - **Significant load increase on source**
- Ongoing Replication
  - **Small load on both servers**
    - Increases with number of hosts, no large scale solution
  - **Comparable to one or two users opening the dashboard**

## Before vs After



Before	After
Two different dashboards to maintain	One central dashboard
Limited automation integration	Full workflow integration
2x the work for user/notification setup	One central user/notification setup
Split data ownership	Shared data ownership
Some notifications impossible because of company limits (SMS)	All notifications working

- Thank you for your attention!