



Wendelin Exanalytics

Security & Safety Design

2014-07-07 – Shanghai



Agenda



Architecture Overview

- **Design Goals**
- **Security**
- **Safety**

Wendelin Core

100% open source

100% Python

Numpy / OpenCV-Python / Scikit-learn / etc.

Data Analytics

NEO

Distributed Storage



ERP5

Elastic PaaS

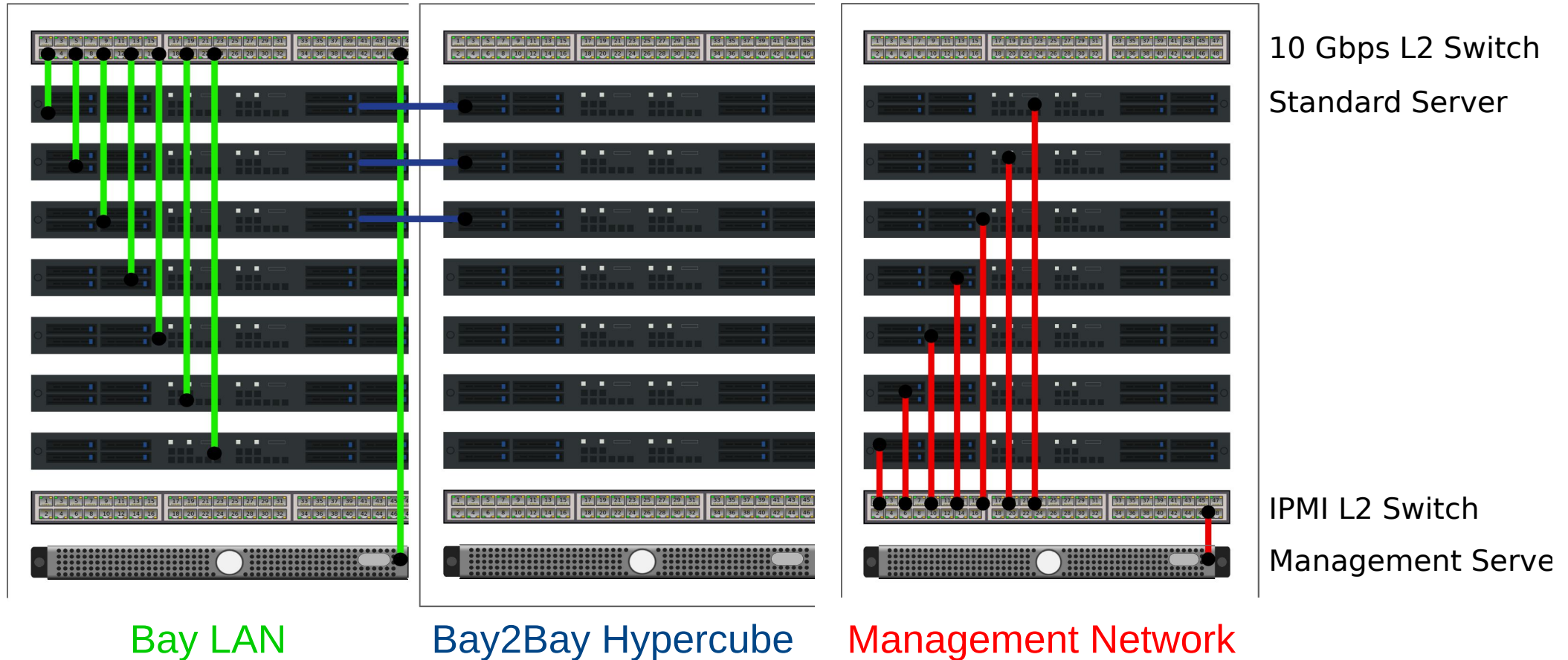
SlapOS

Multicloud Deployment

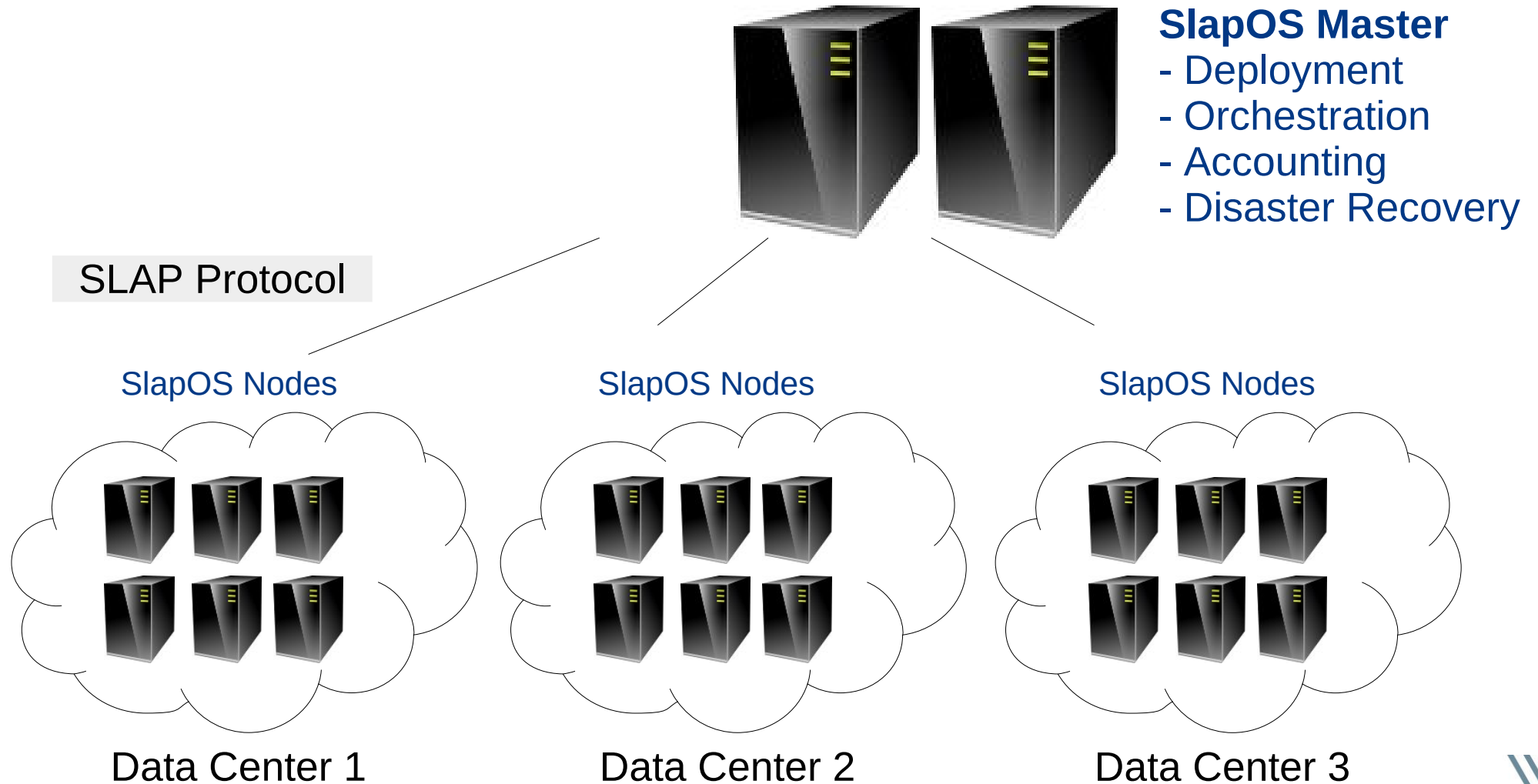


Multi Data Center

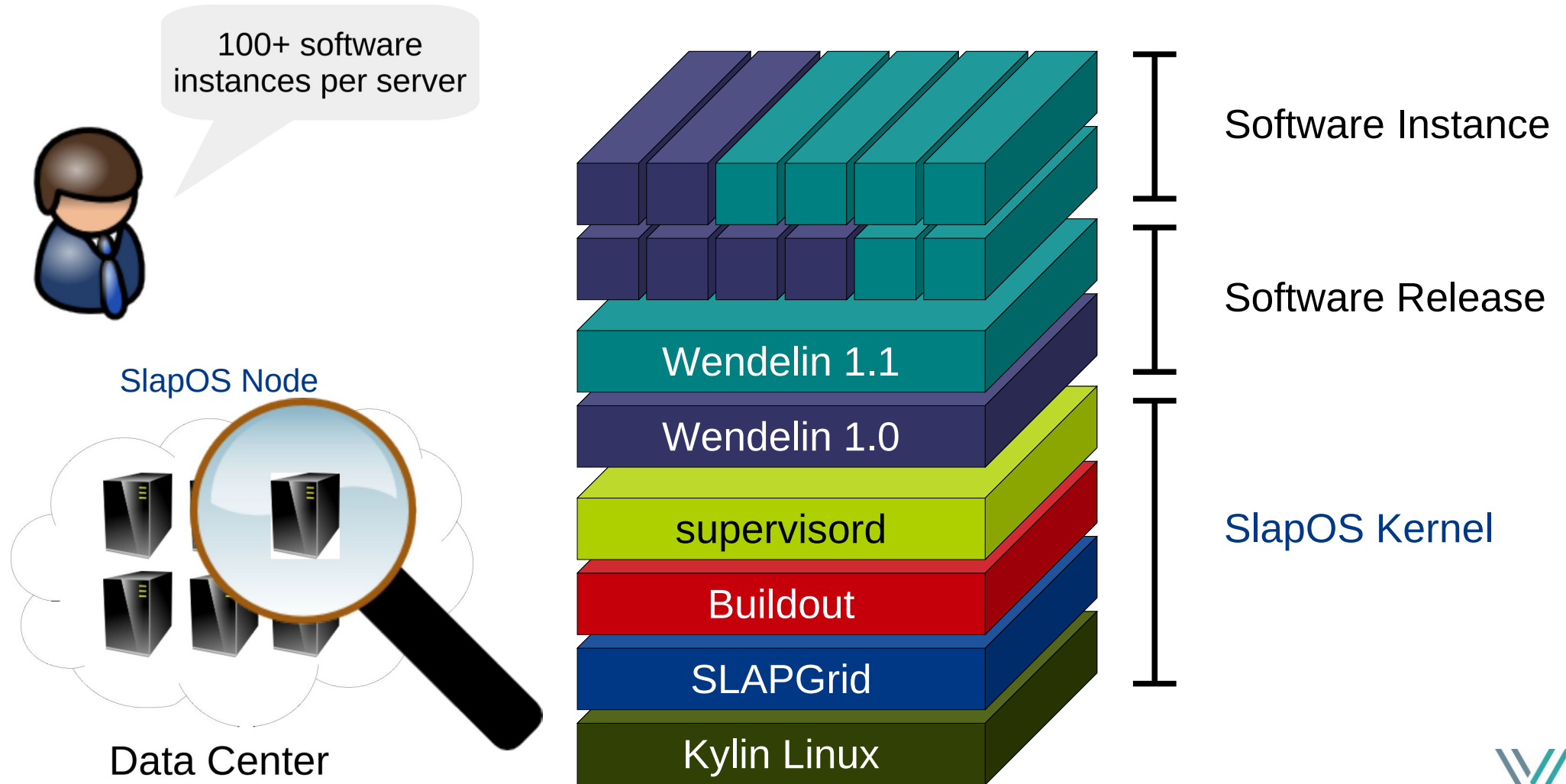
Data Center Overview



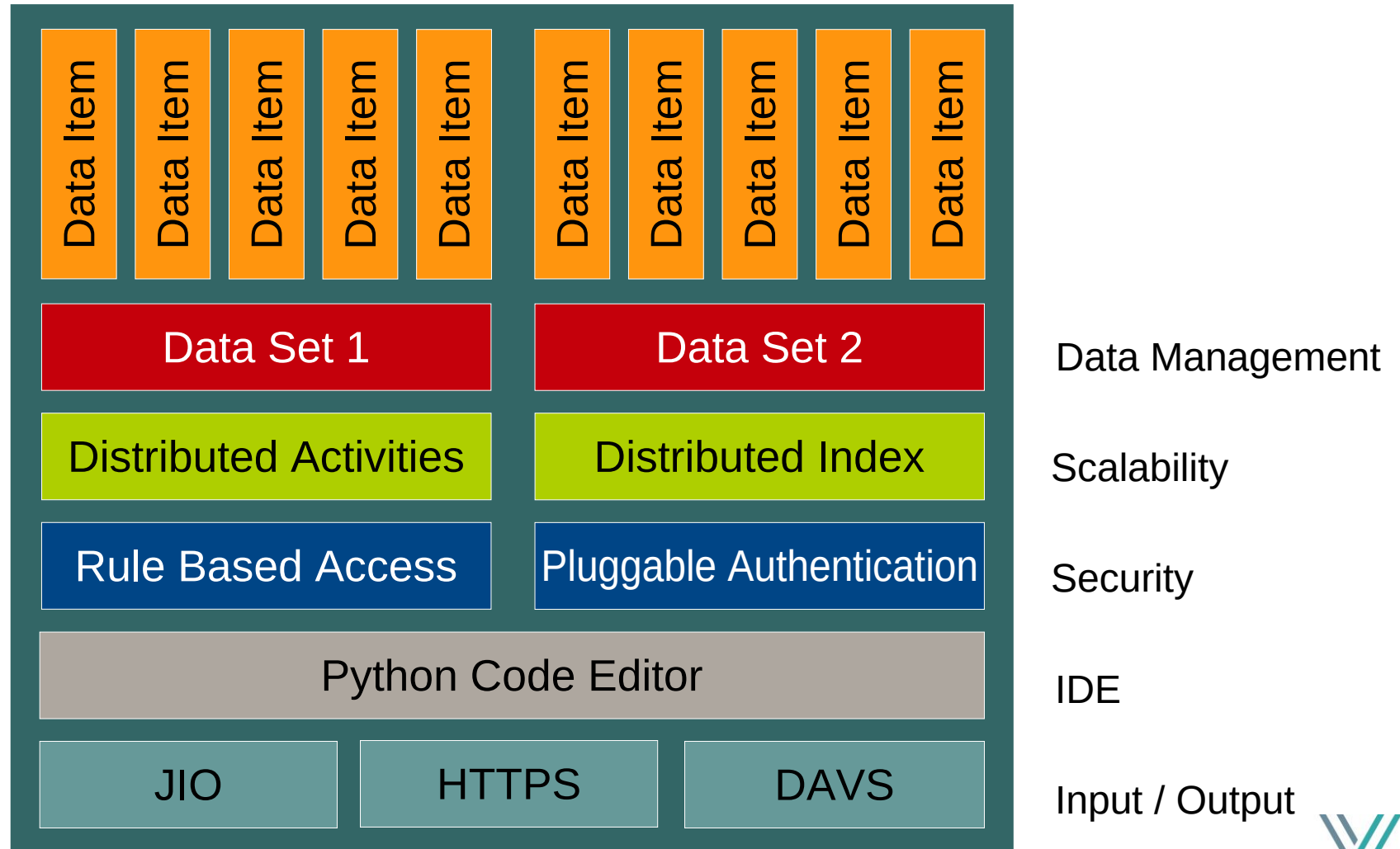
SlapOS Master Overview



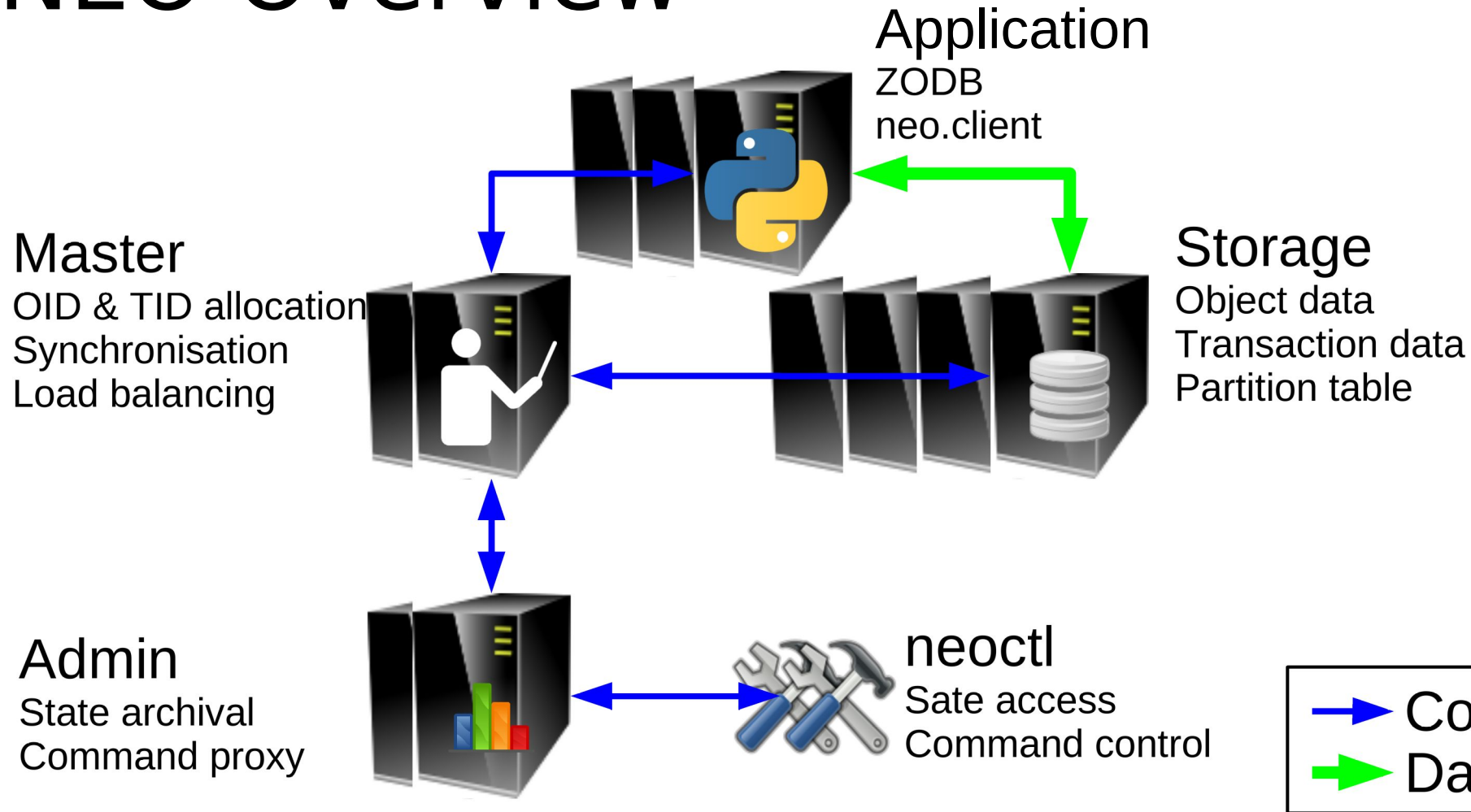
SlapOS Node Overview



ERP5 PaaS Overview




NEO Overview




Numpy Overview

neo.ndarray


| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|----|----|----|




| | |
|---|---|
| 1 | 1 |
| 5 | 5 |
| 9 | 9 |



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| 2 | 2 |
| 6 | 6 |
| 10 | 10 |



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| 3 | 3 |
| 7 | 7 |
| 11 | 11 |



| | |
|----|----|
| 4 | 4 |
| 8 | 8 |
| 12 | 12 |



Agenda

- **Architecture Overview**



Design Goals

- **Security**
- **Safety**

Security & Safety

- **Security**

- Data Encryption
- Data Access Rule
- User Authentication
- Computer Authentication
- Software Authentication
- Service Authentication
- Zero Knowledge
- Intrusion protection
- Public Key Infrastructure

- **Safety**

- Availability
- Consistency
- Scalability
- Persistence
- Disaster Recovery

Agenda

- **Architecture Overview**

- **Design Goals**

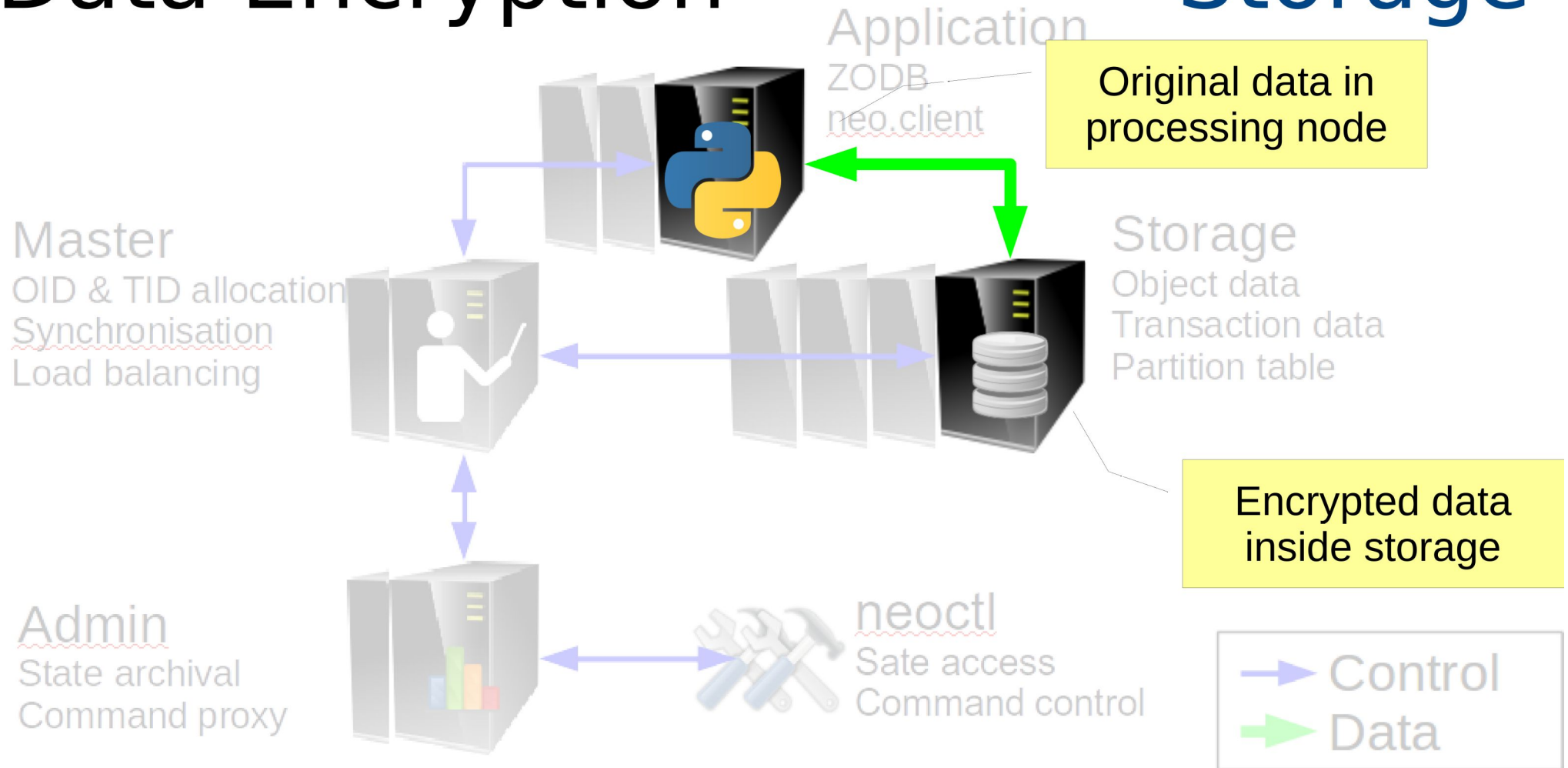


- **Security**

- **Safety**

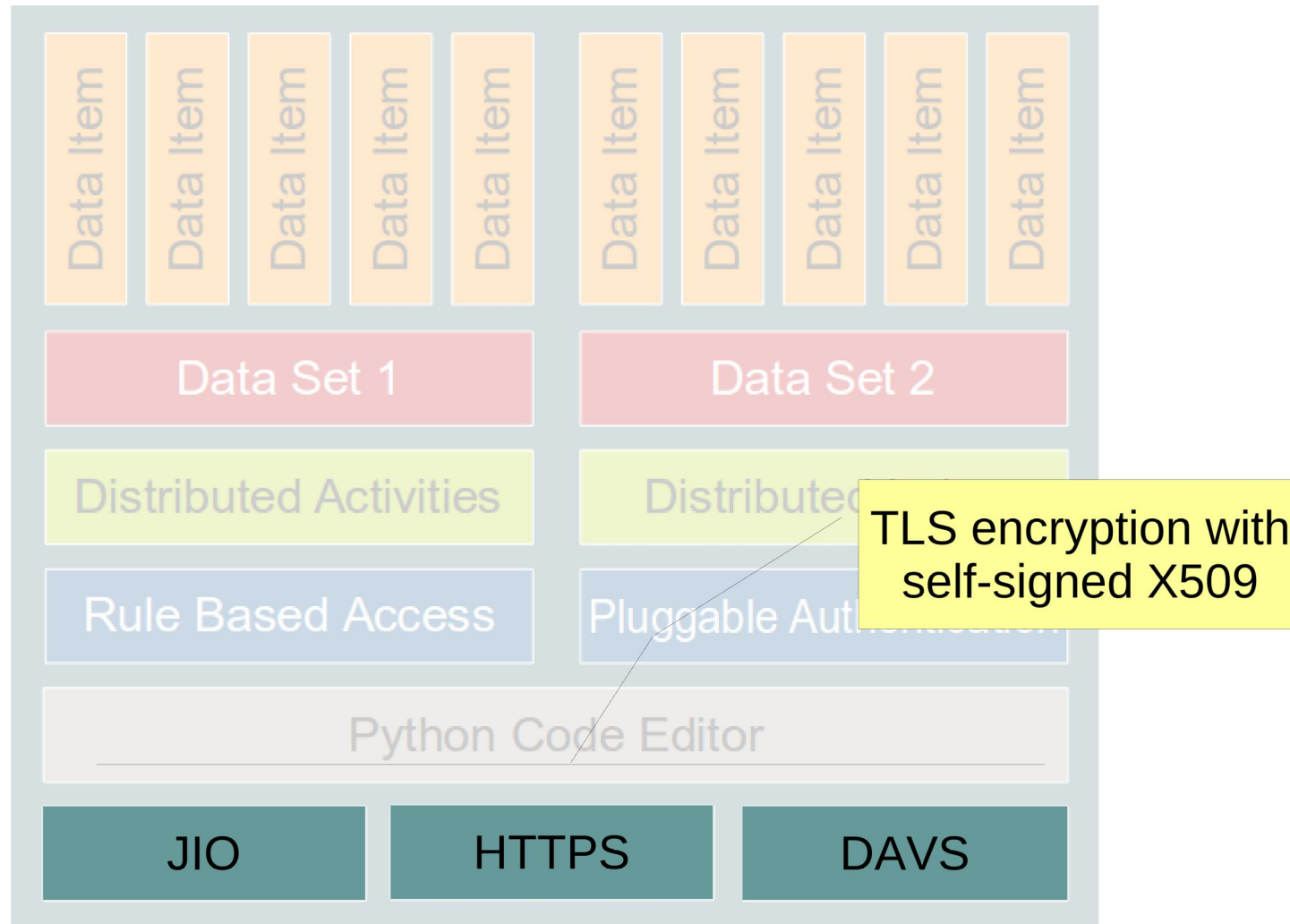
Data Encryption

Storage



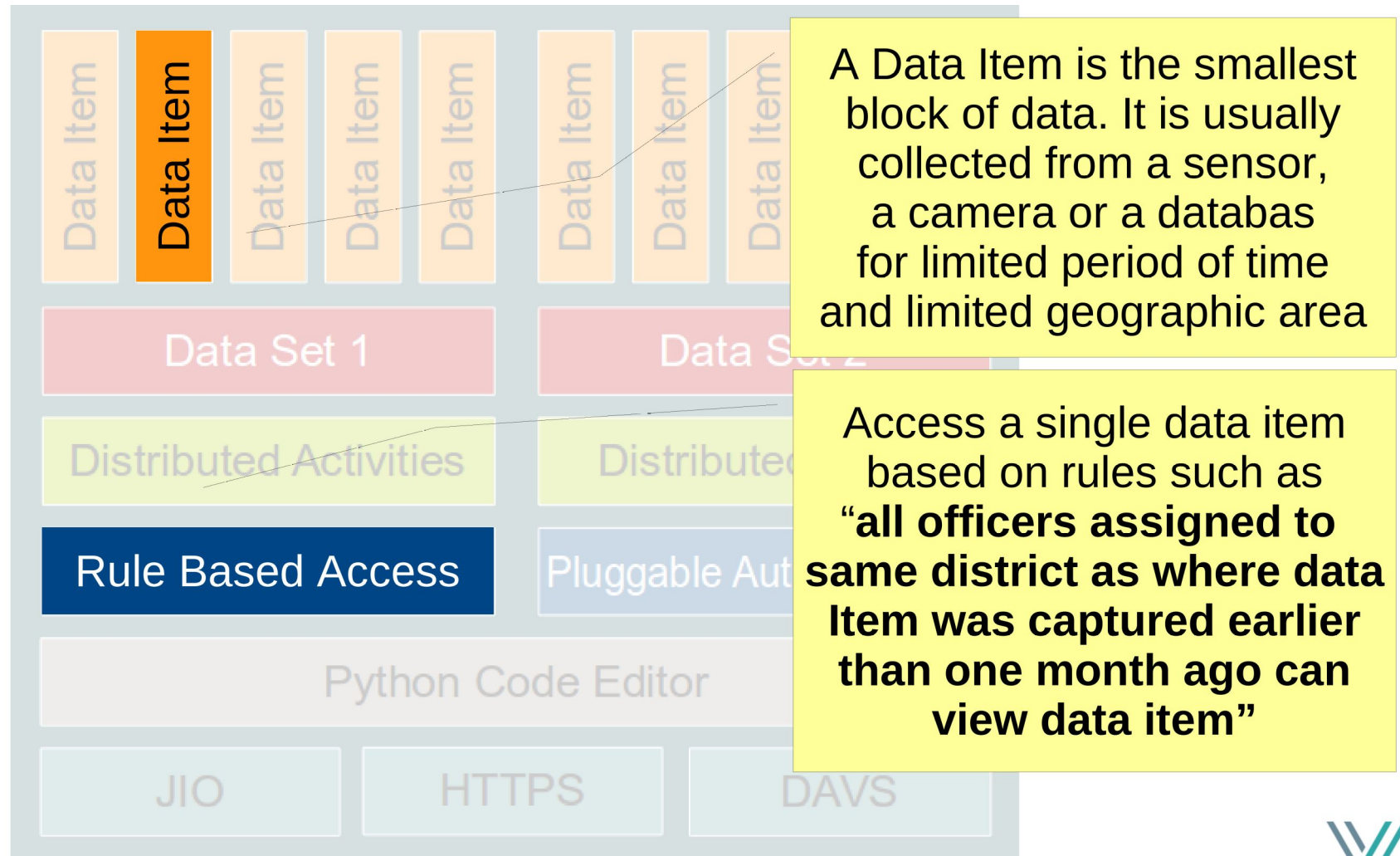
Data Encryption

I/O



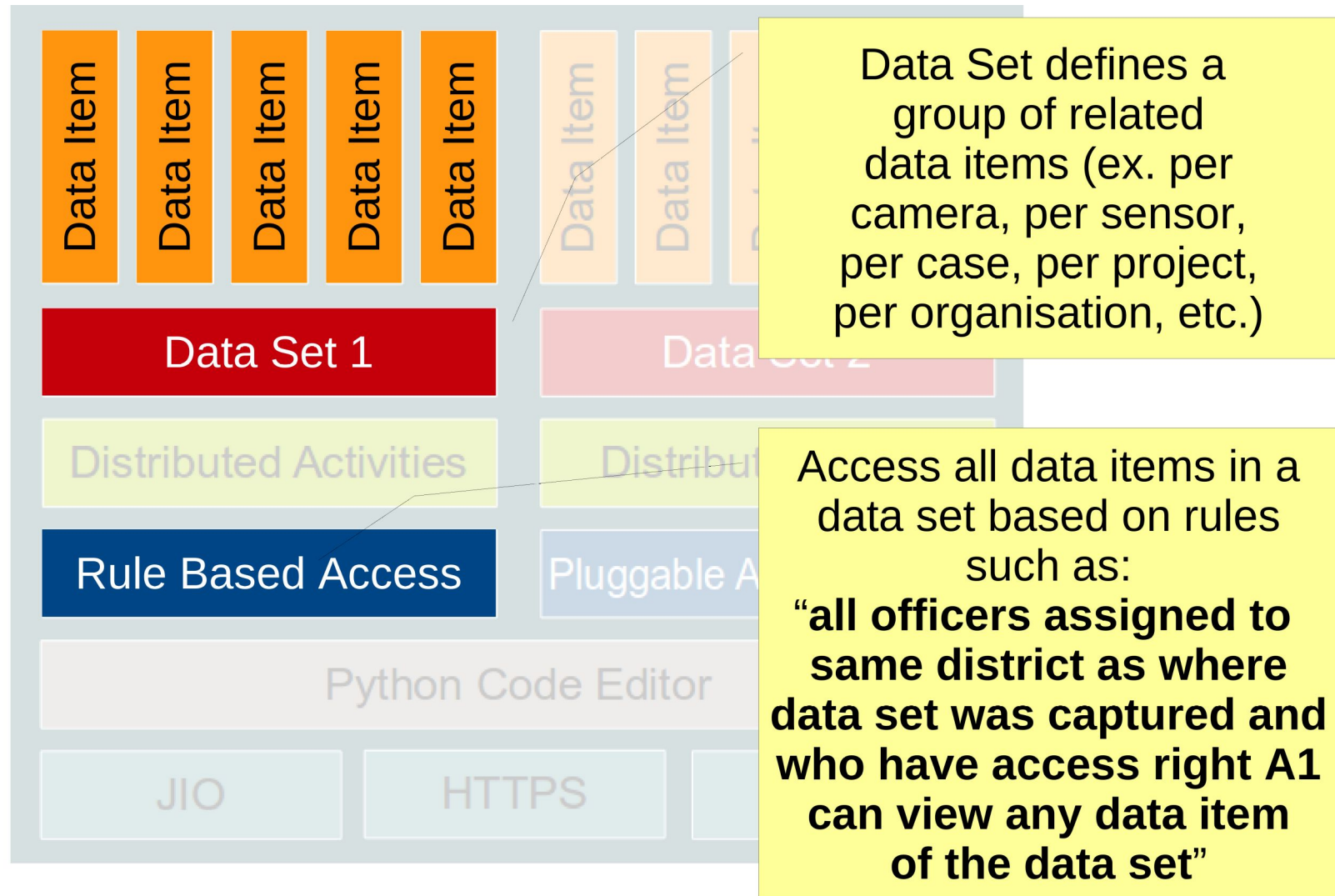
Data Access Rules

Data Item



Data Access Rules

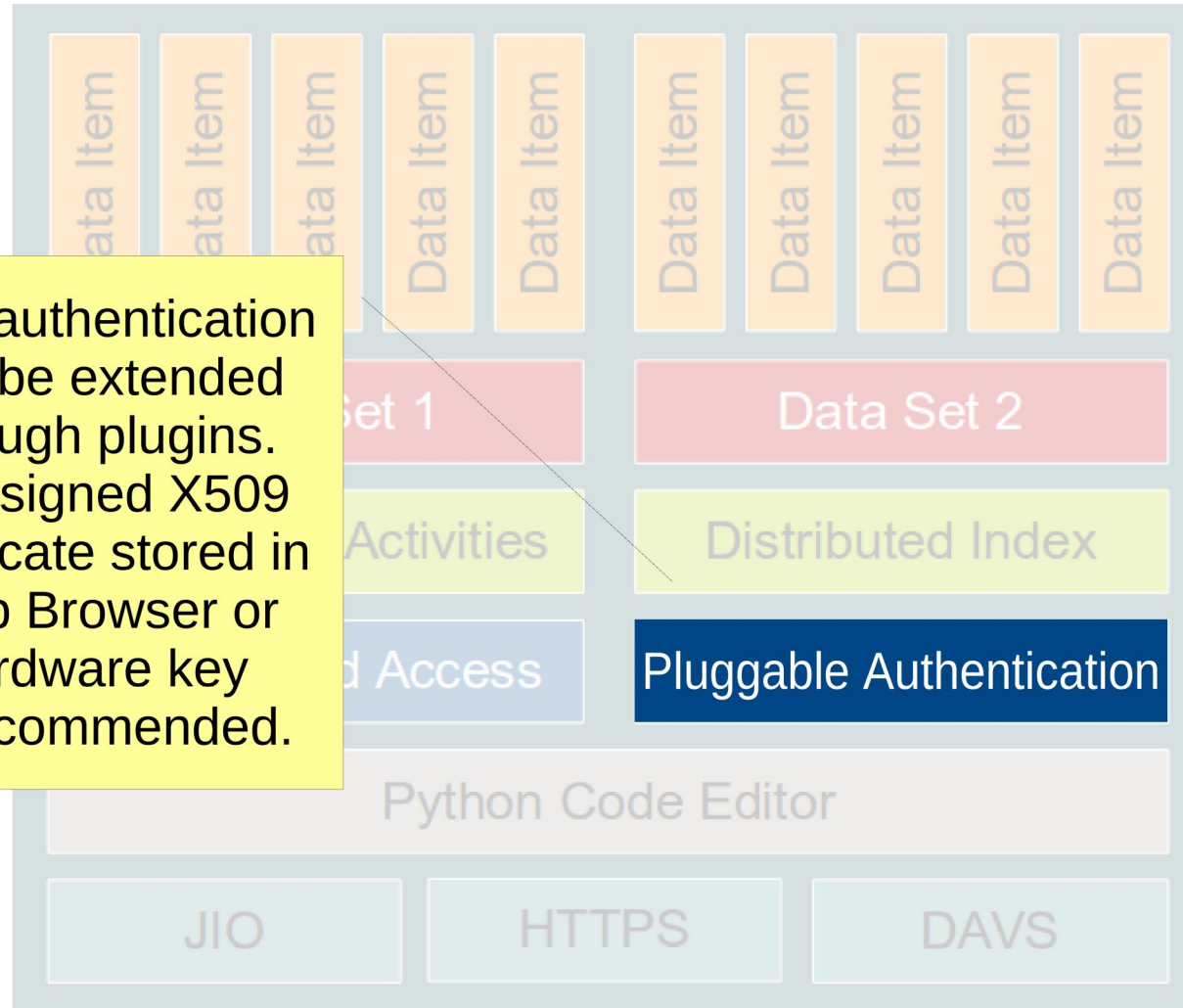
Data Set



User Authentication

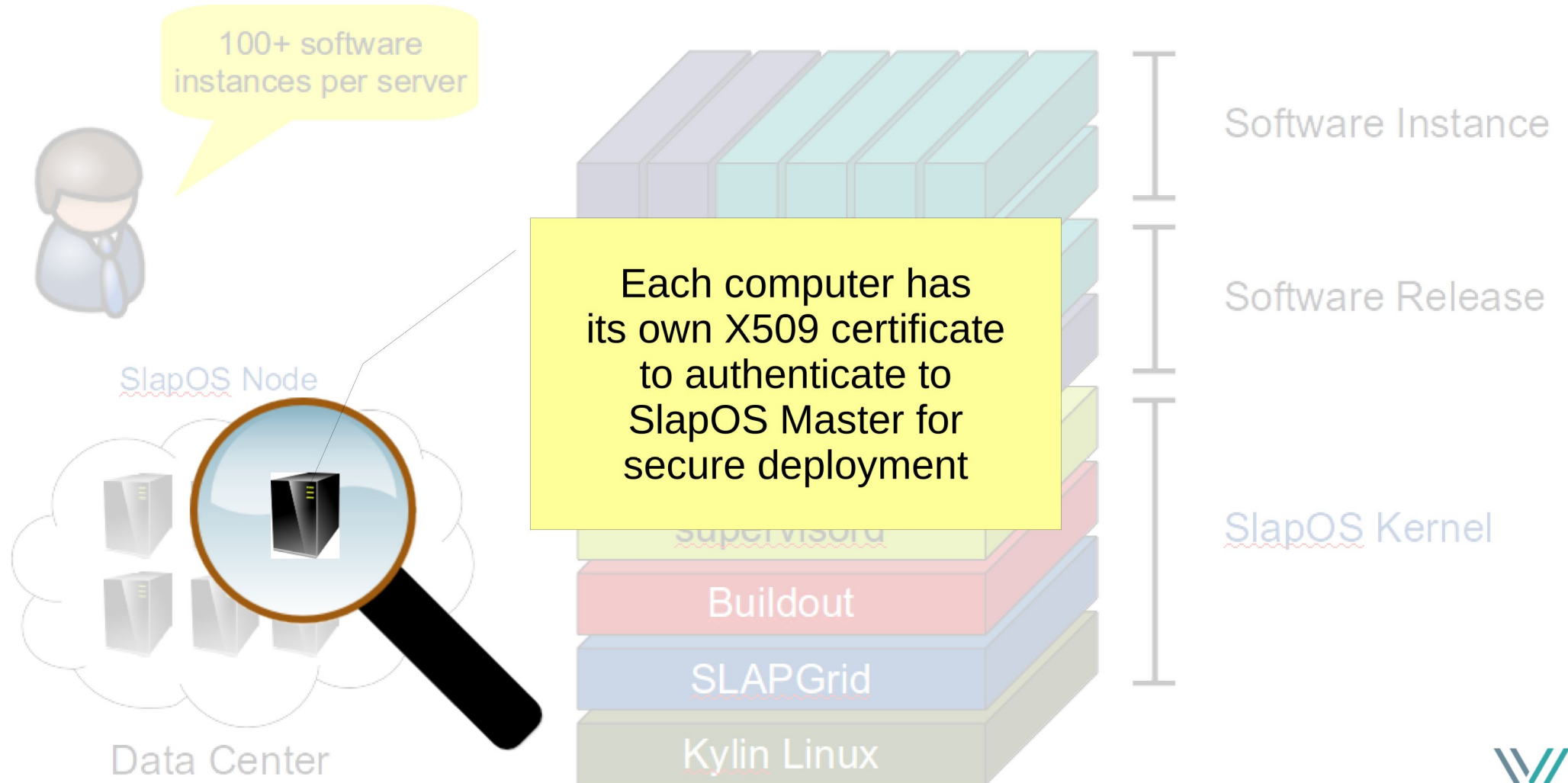
X509

User authentication can be extended through plugins. Self-signed X509 certificate stored in Web Browser or hardware key is recommended.



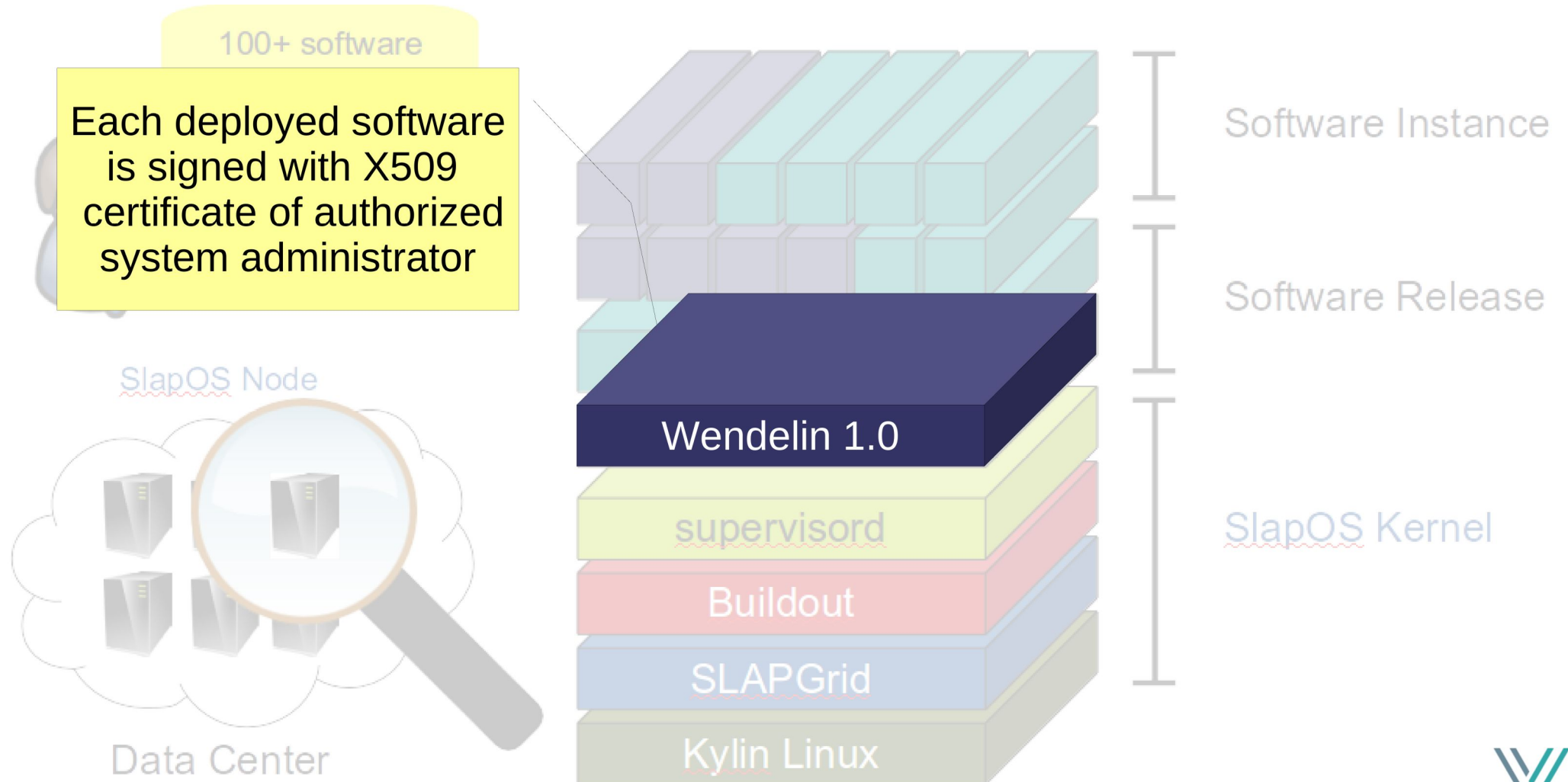
Computer Authentication

X509



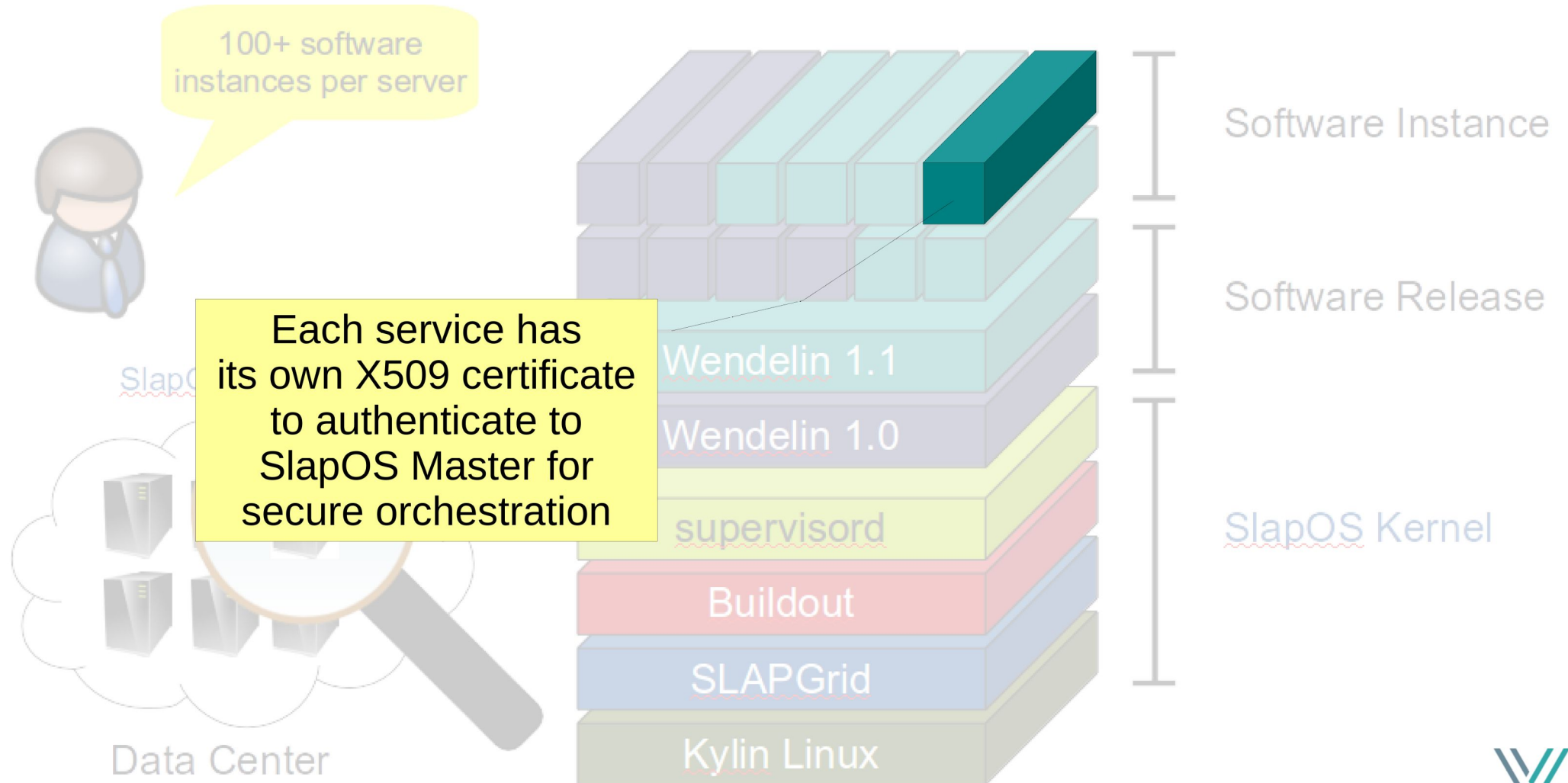
Software Authentication

X509



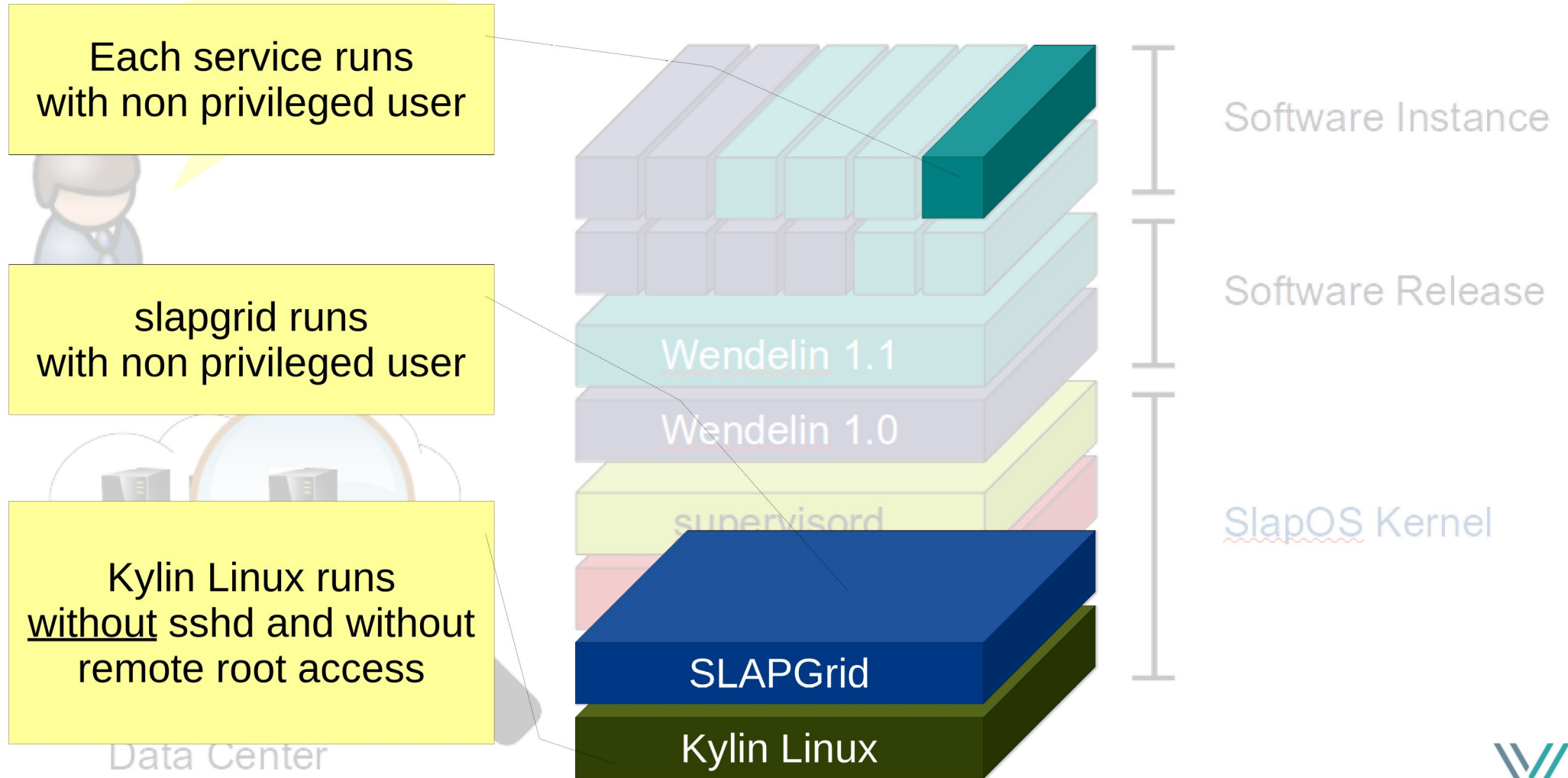
Service Authentication

X509



Zero Knowledge

zero root



Zero Knowledge

zero password

No password or credential to access running services is kept in SlapOS Master



SlapOS Master

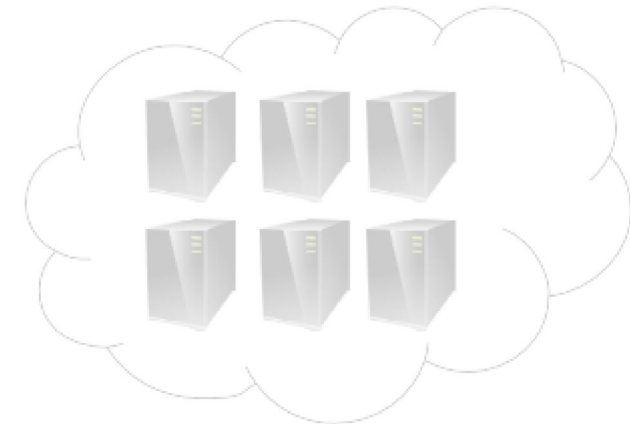
- Deployment
- Orchestration
- Accounting
- Disaster Recovery

SLAP Protocol

Credentials to access a service are kept as a hash in the computer that runs the service

SlapOS Nodes

SlapOS Nodes

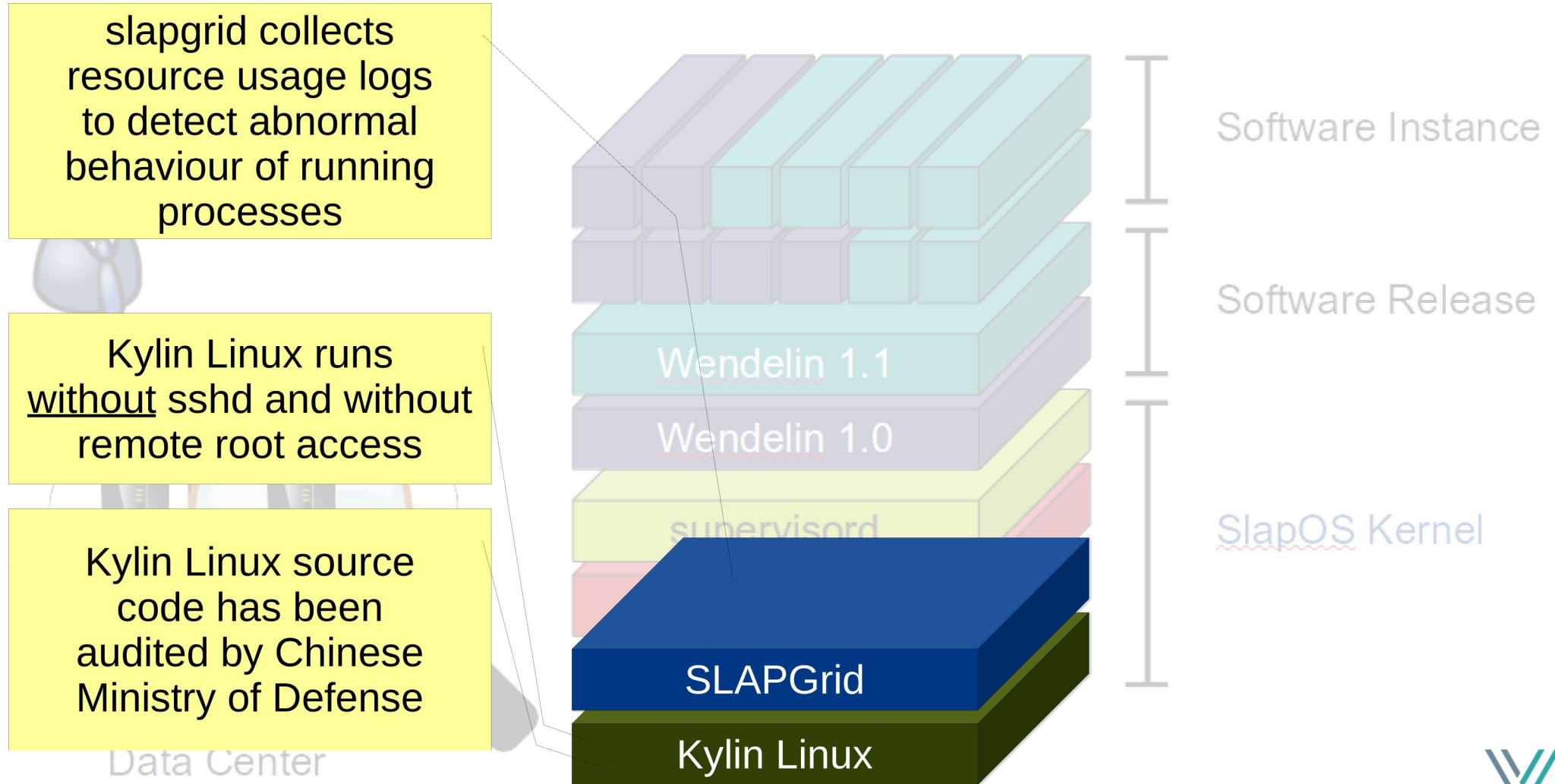


Data Center 1

Data Center 2

Data Center 3

Intrusion Protection



Public Key Infrastructure (PKI)

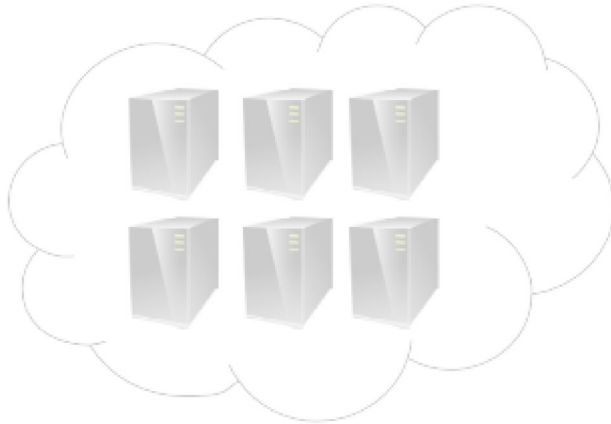
SlapOS Master acts as PKI and generates X509 certificates for users, computers, software and services



SlapOS Master

- Deployment
- Orchestration
- Accounting
- Disaster Recovery

SlapOS Nodes



Data Center 1

SlapOS Nodes



Data Center 2

SlapOS Nodes



Data Center 3

Agenda

- **Architecture Overview**
- **Design Goals**
- **Security**



Safety

Availability

SlapOS

System remains available
in case of unavailability
of SlapOS master

System remains available
in case of unavailability
of SlapOS node



SlapOS Master

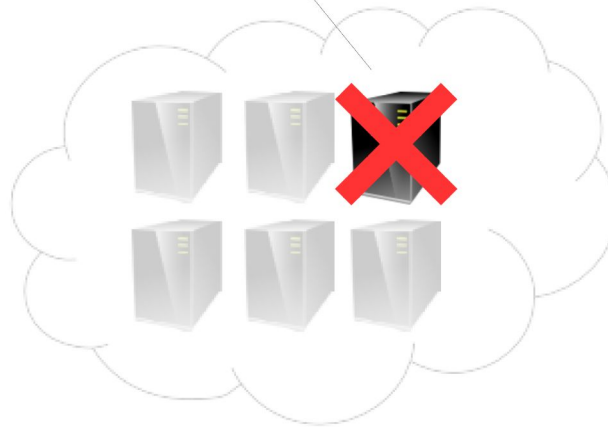
- Deployment
- Orchestration
- Accounting
- Disaster Recovery

SlapOS Nodes



Data Center 1

SlapOS Nodes



Data Center 2

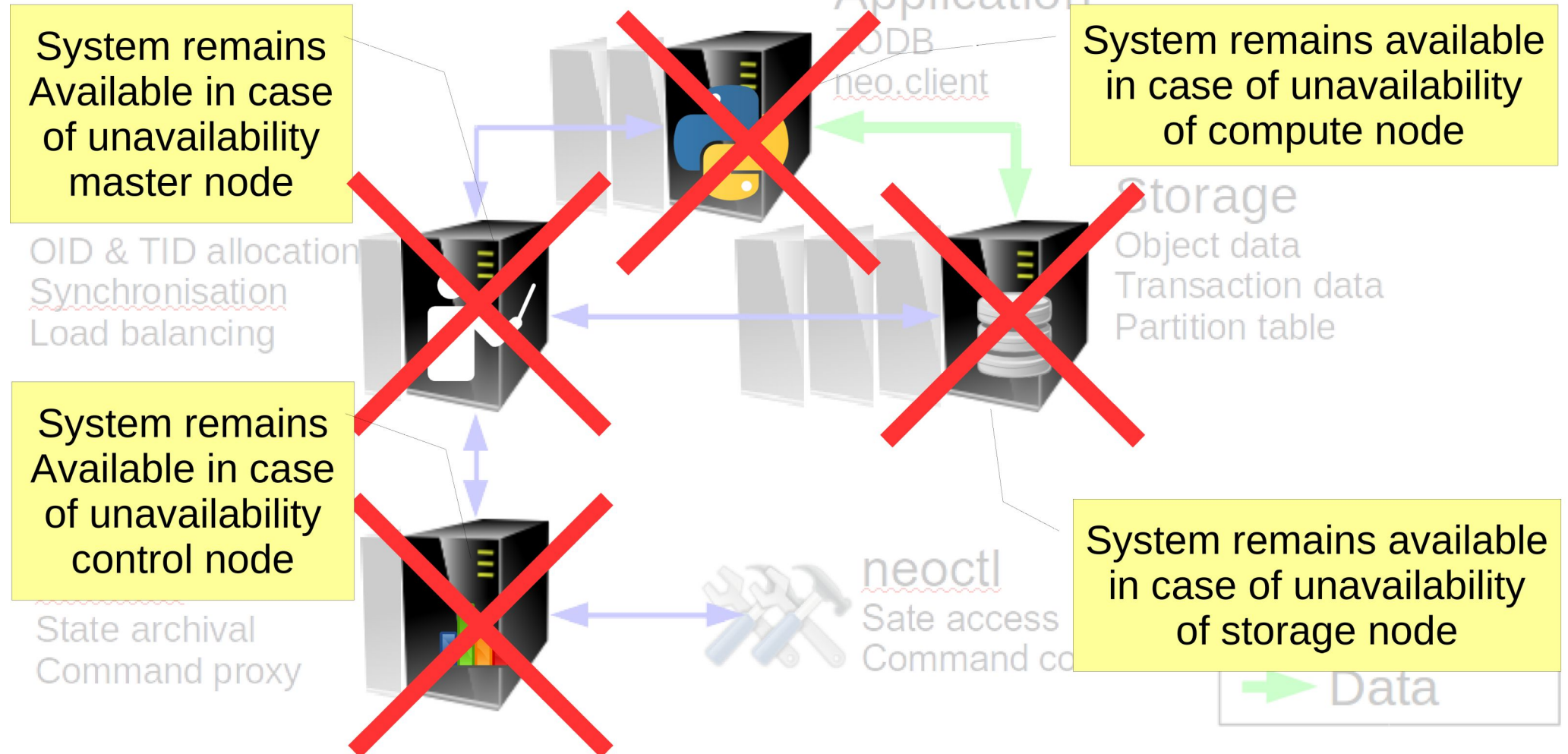
SlapOS Nodes



Data Center 3

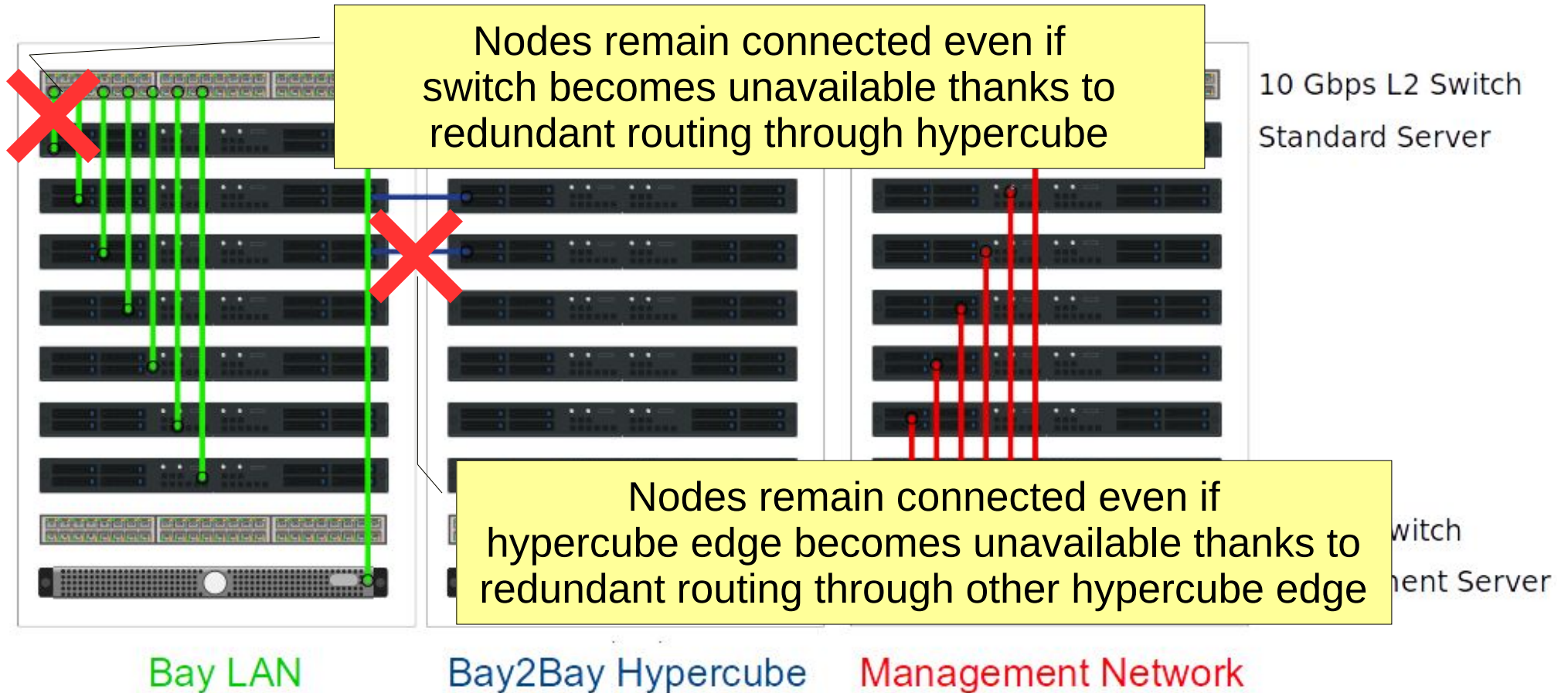
Availability

NEO



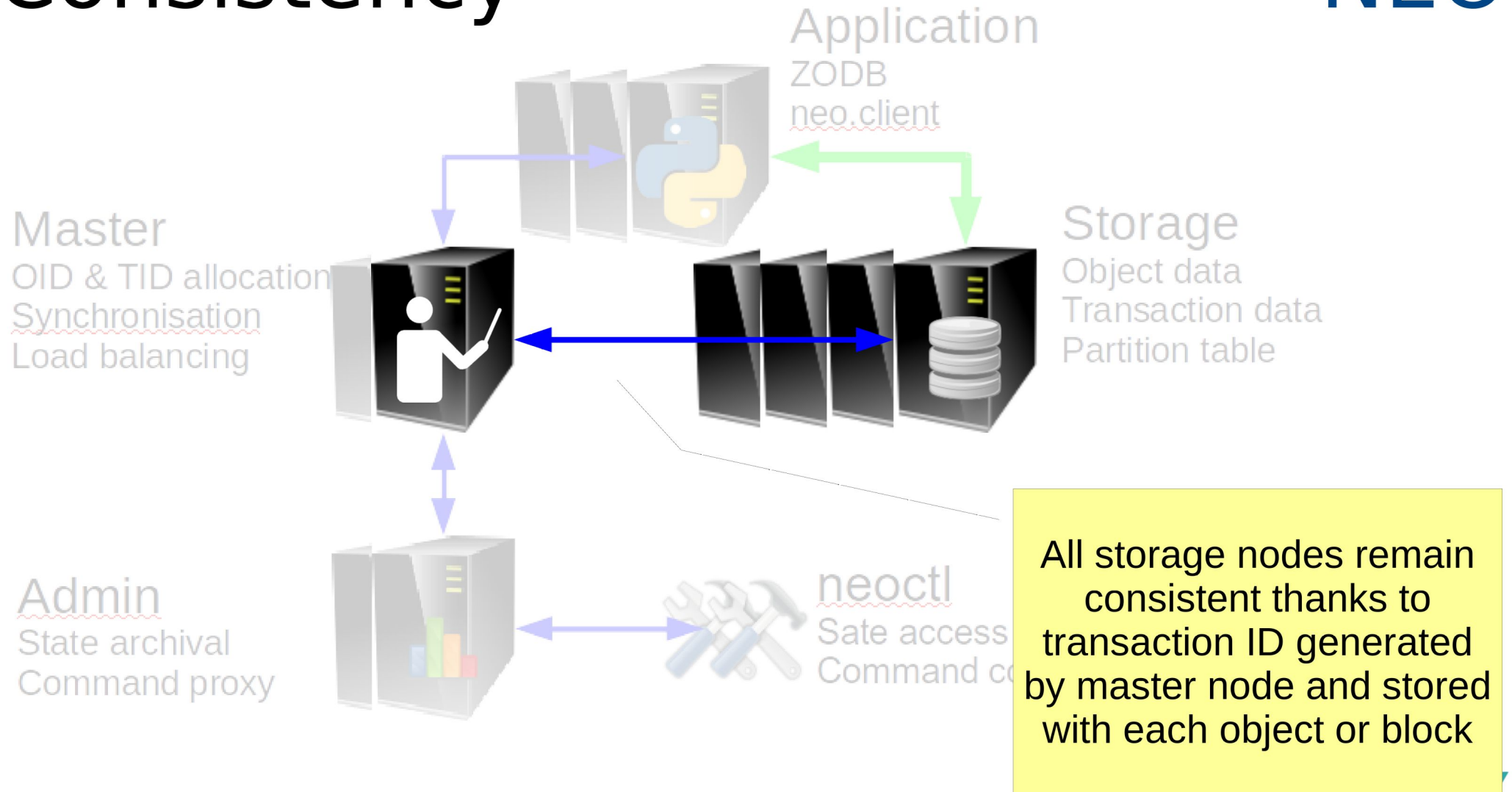
Availability

LAN



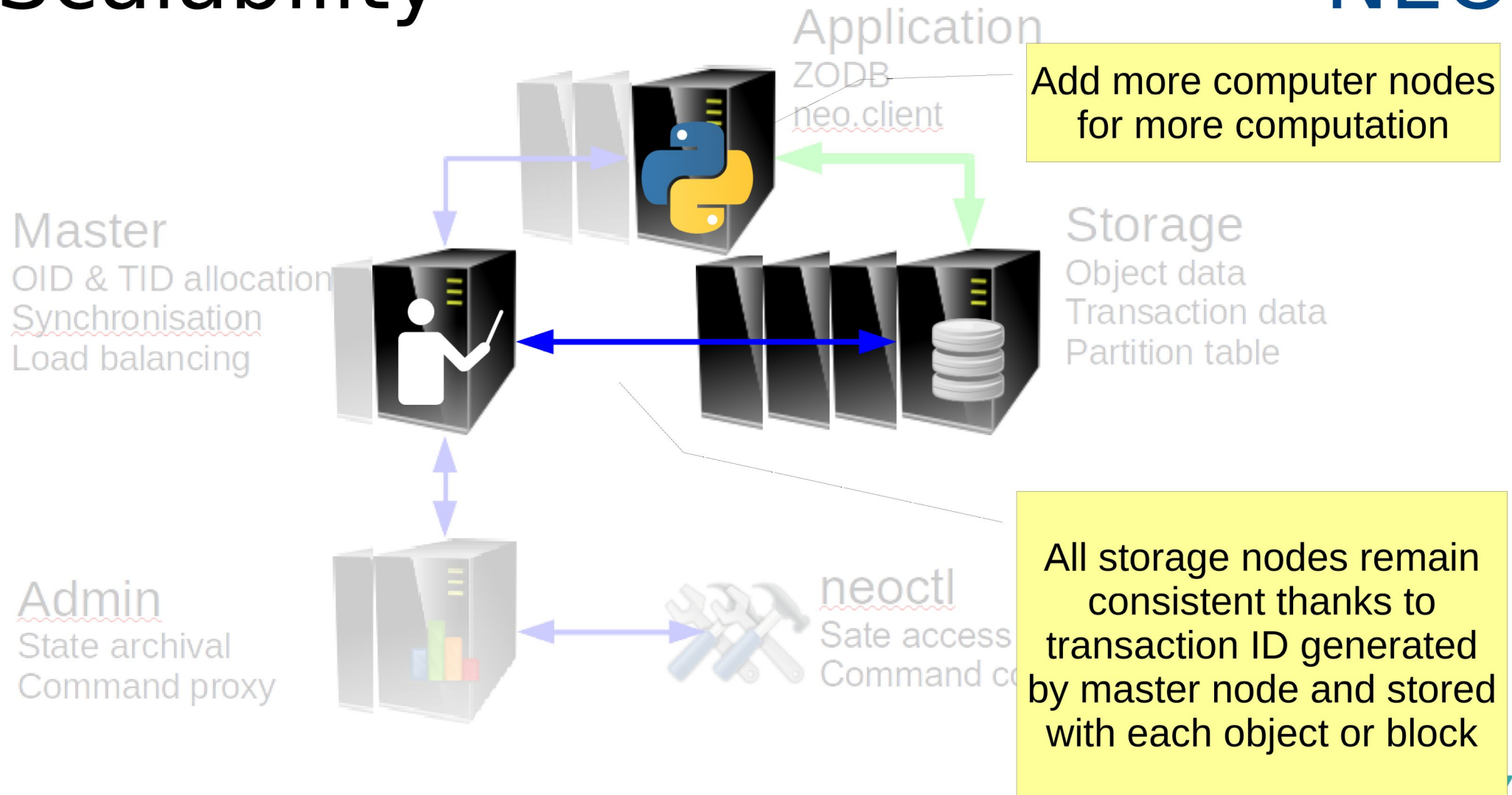
Consistency

NEO



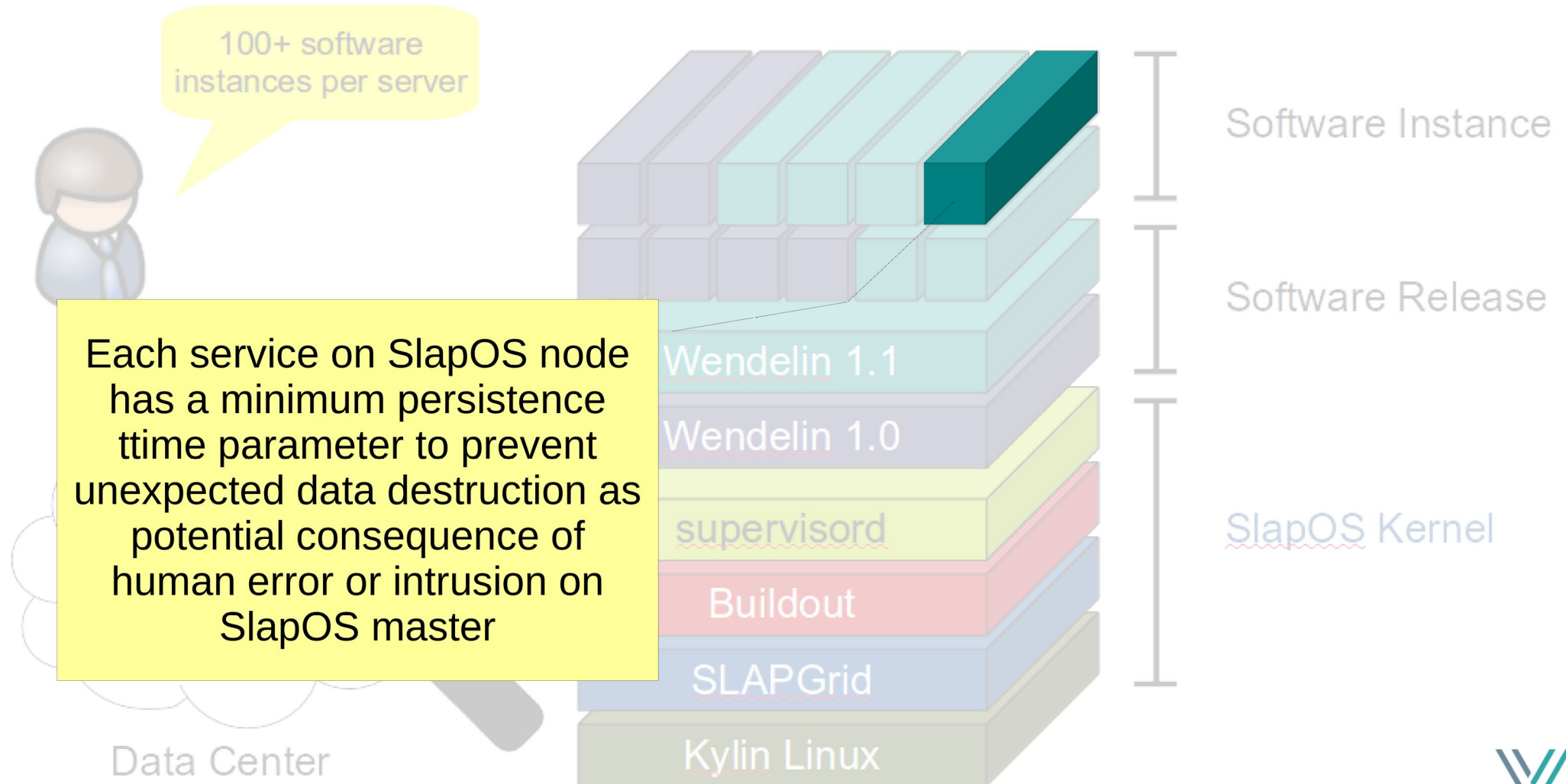
Scalability

NEO



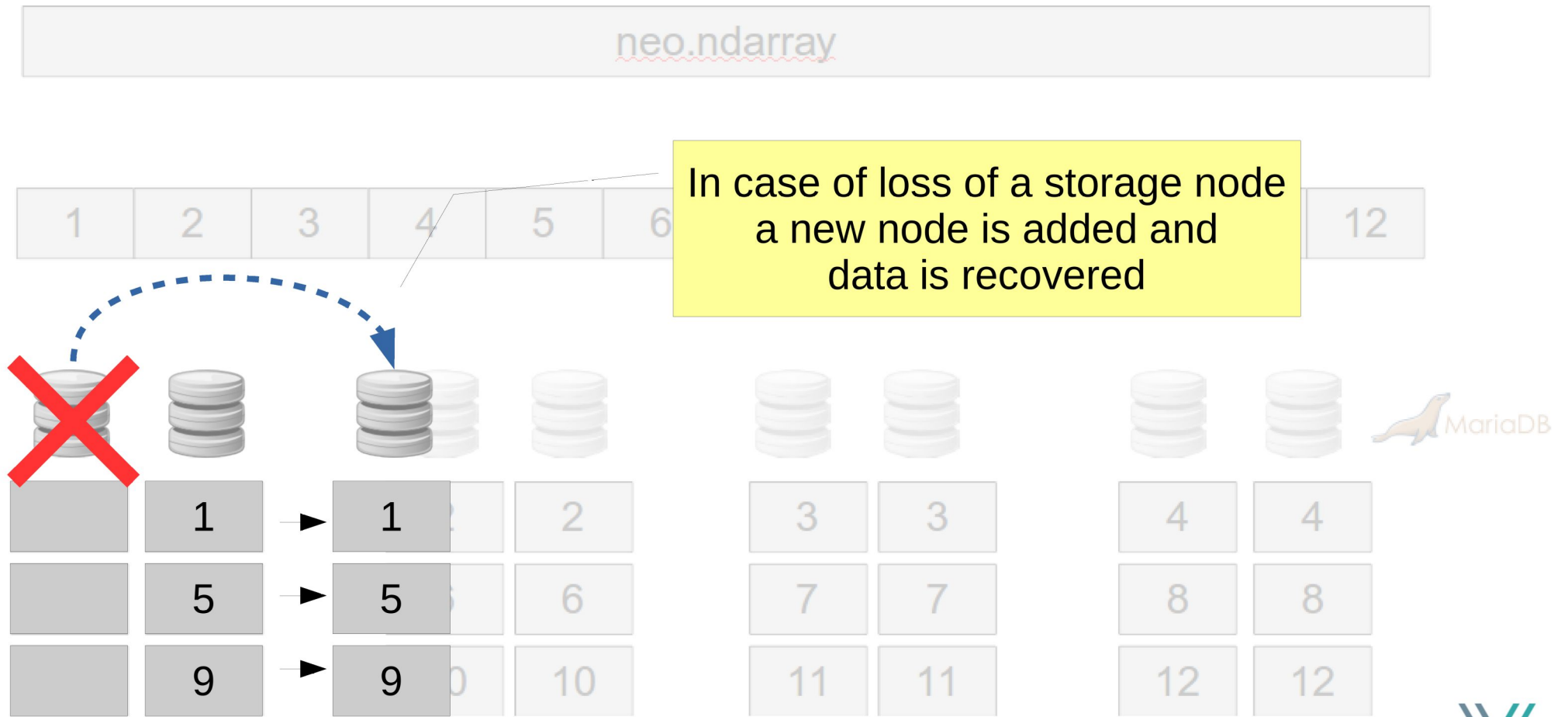
Persistence

SlapOS



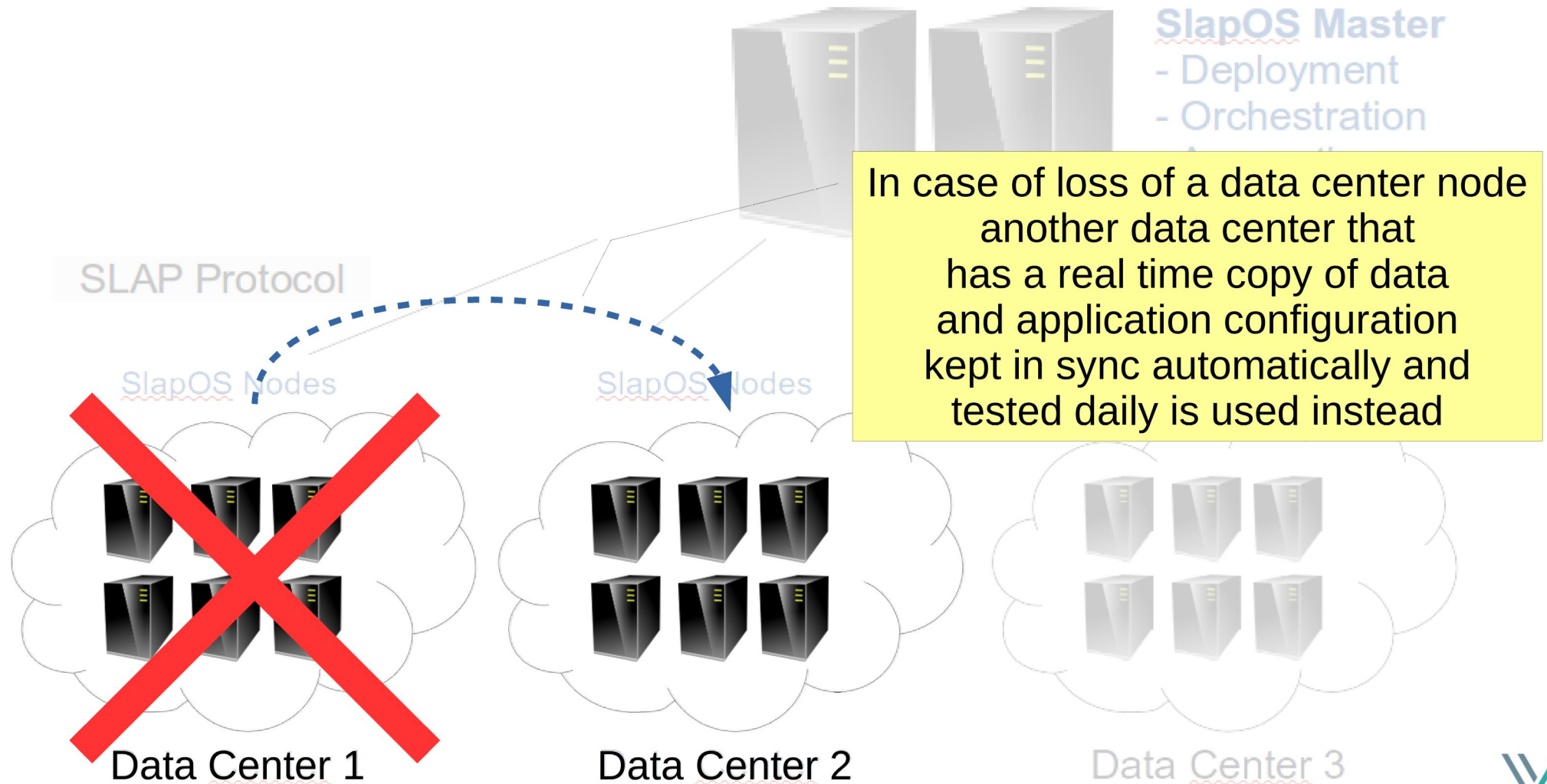
Disaster Recovery

Storage



Disaster Recovery

Datacenter





Wendelin Exanalytics *Security & Safety Design*

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Agenda

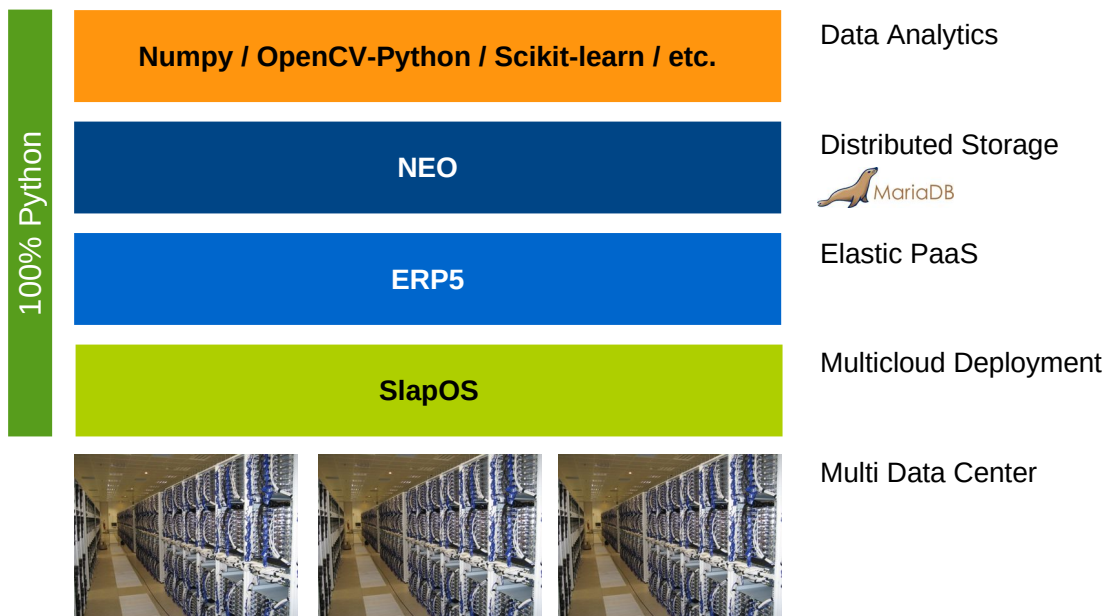


Architecture Overview

- **Design Goals**
- **Security**
- **Safety**

Wendelin Core

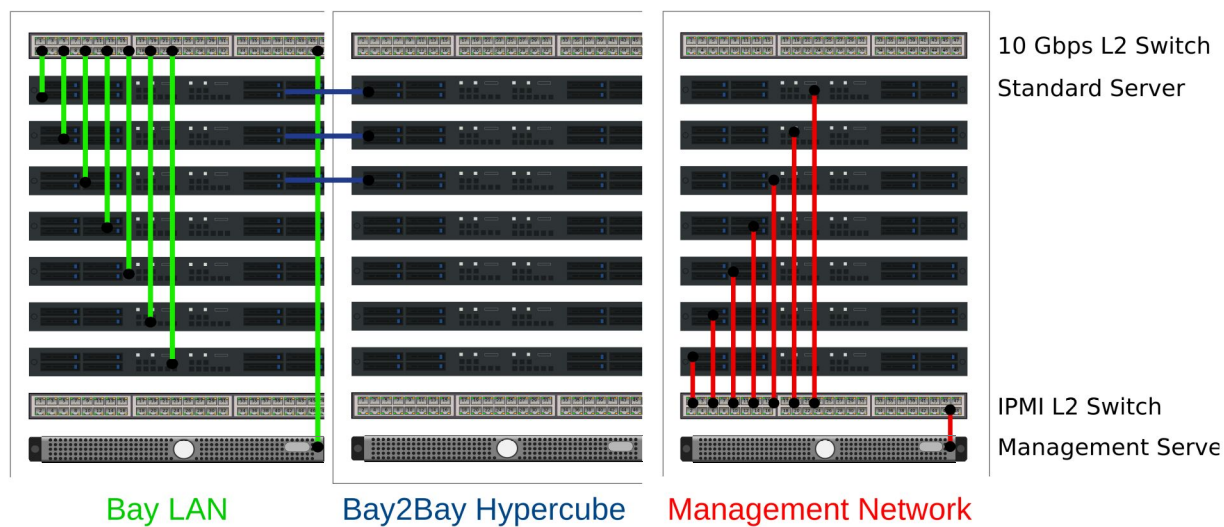
100% open source



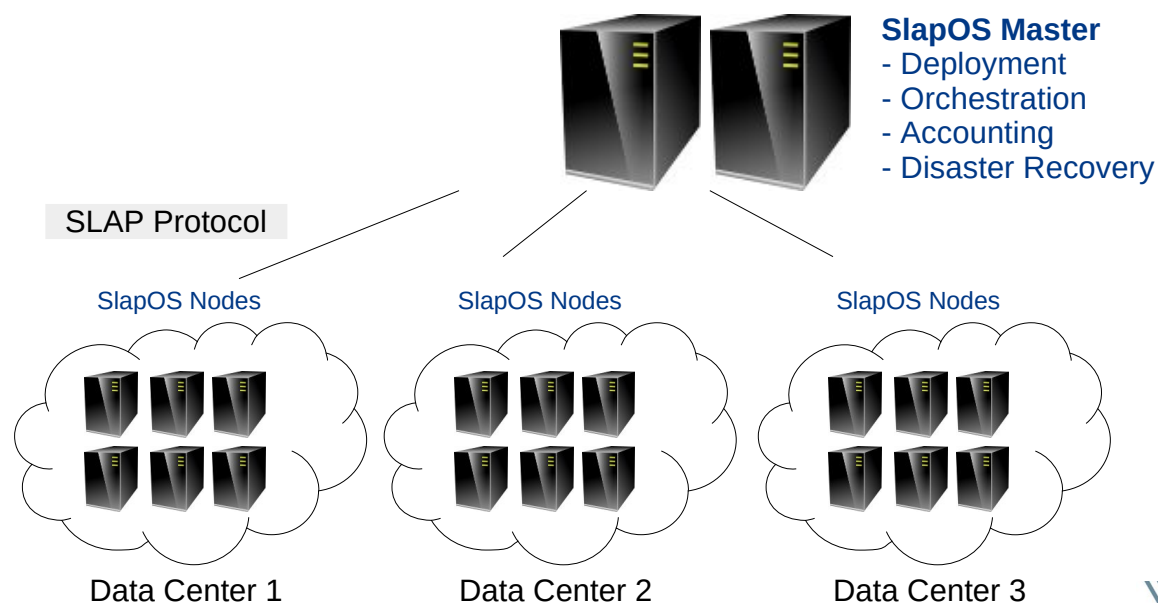
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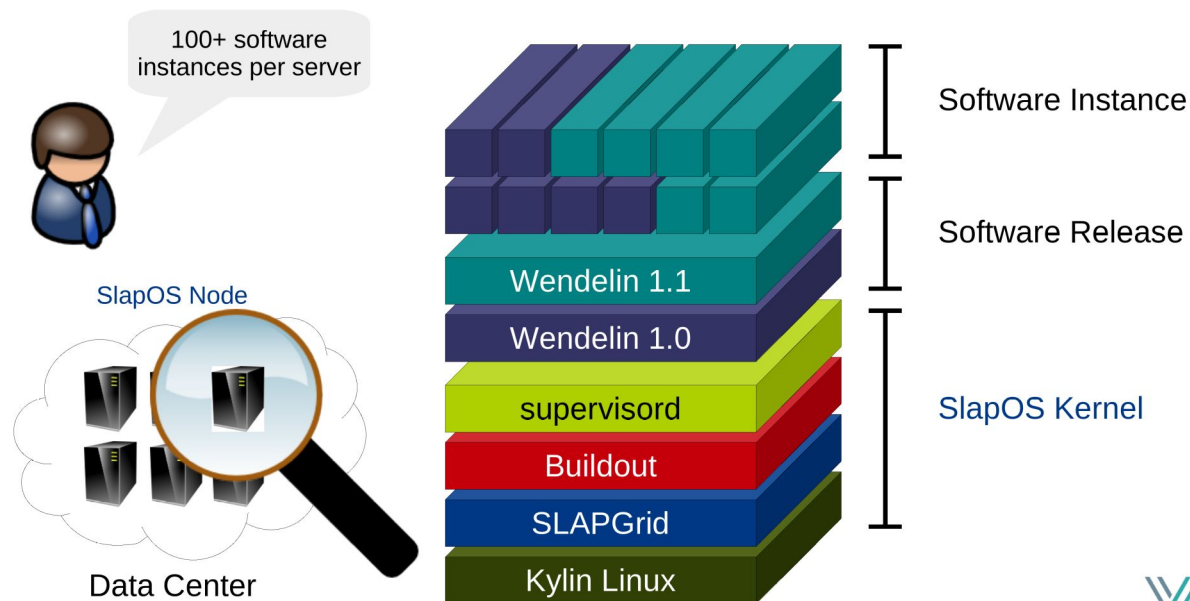
Data Center Overview



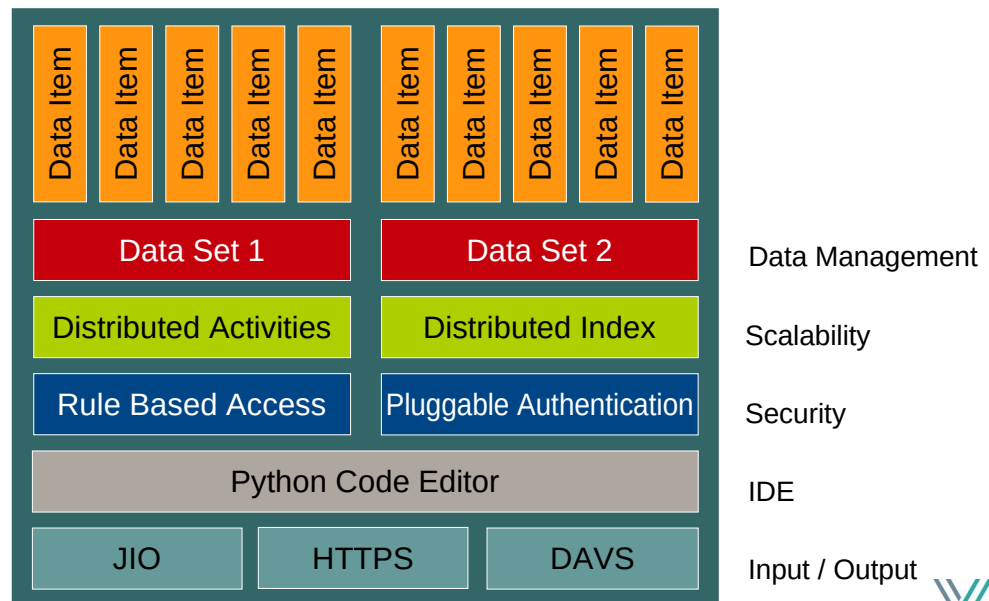
SlapOS Master Overview



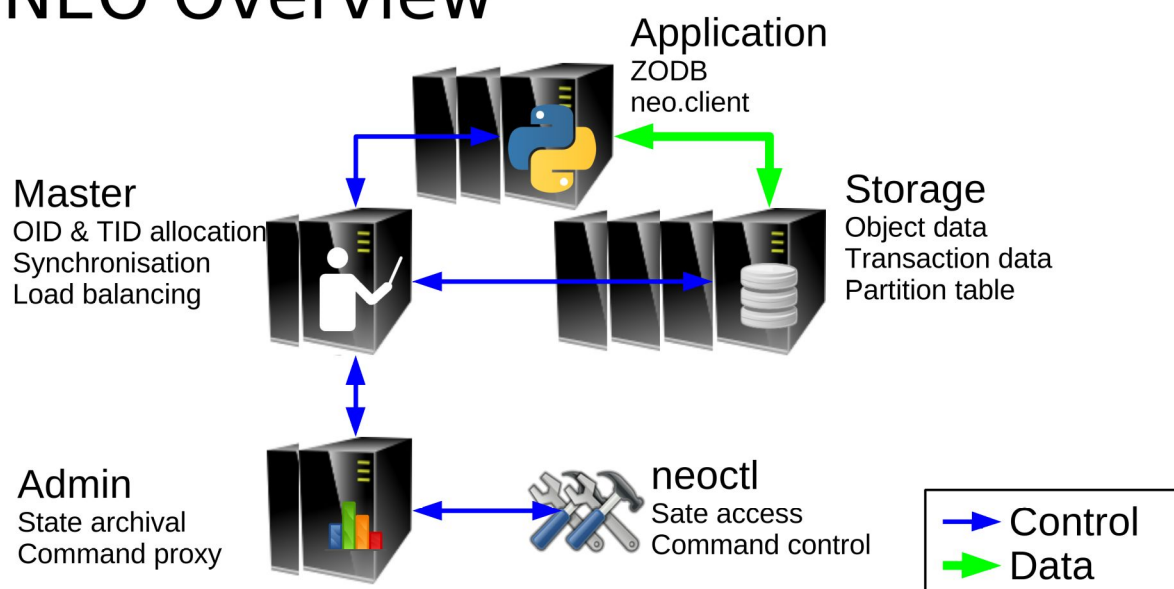
SlapOS Node Overview



ERP5 PaaS Overview



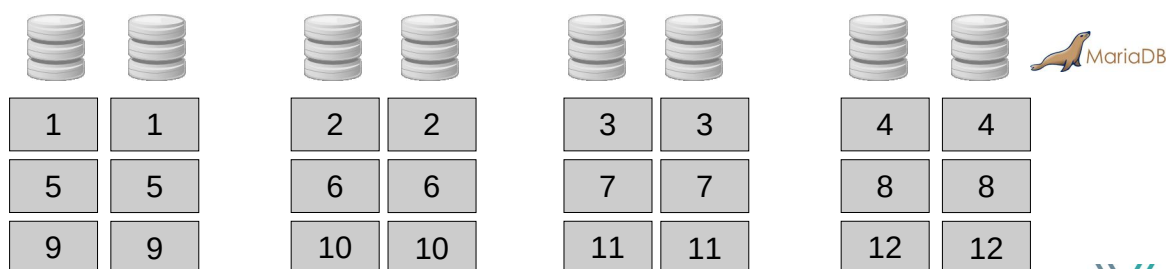
NEO Overview



Numpy Overview

neo.ndarray

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Security & Safety

- **Security**

- Data Encryption
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- Computer Authentication
- Software Authentication
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- Zero Knowledge
- Intrusion protection
- Public Key Infrastructure

- **Safety**

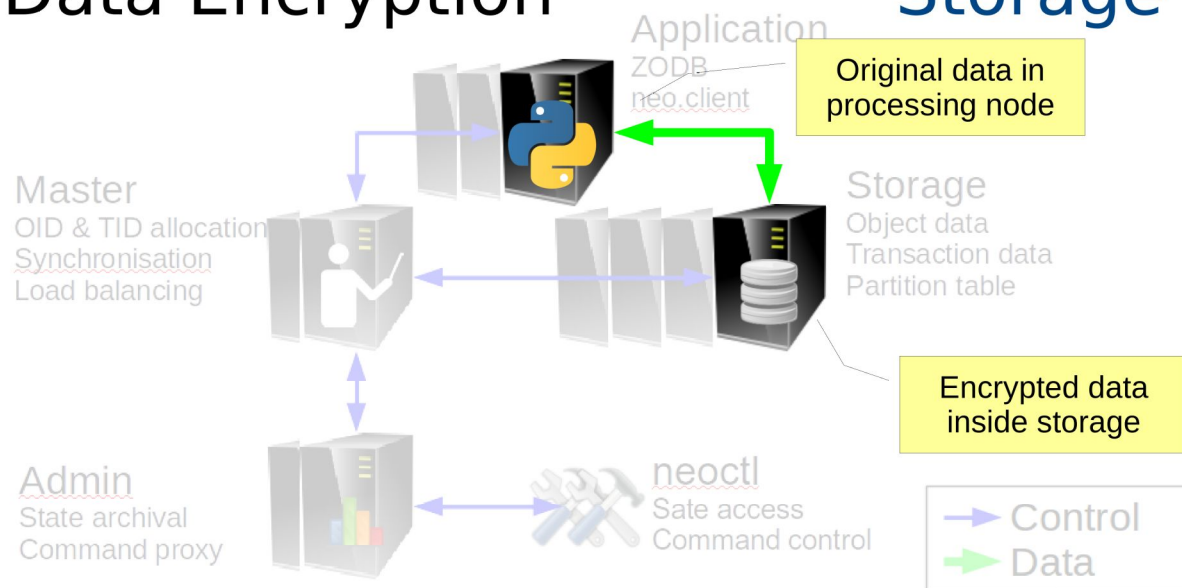
- Availability
- Consistency
- Scalability
- Persistence
- Disaster Recovery

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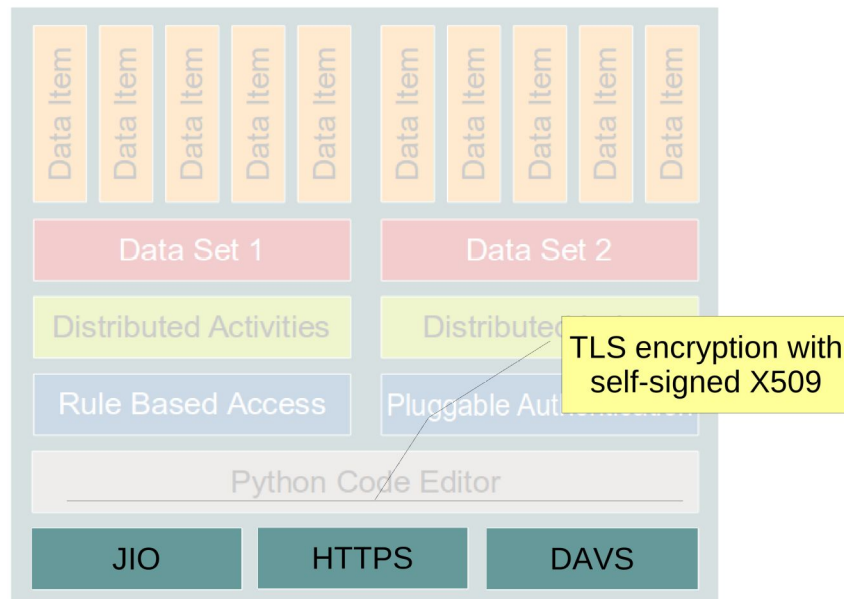
Data Encryption

Storage



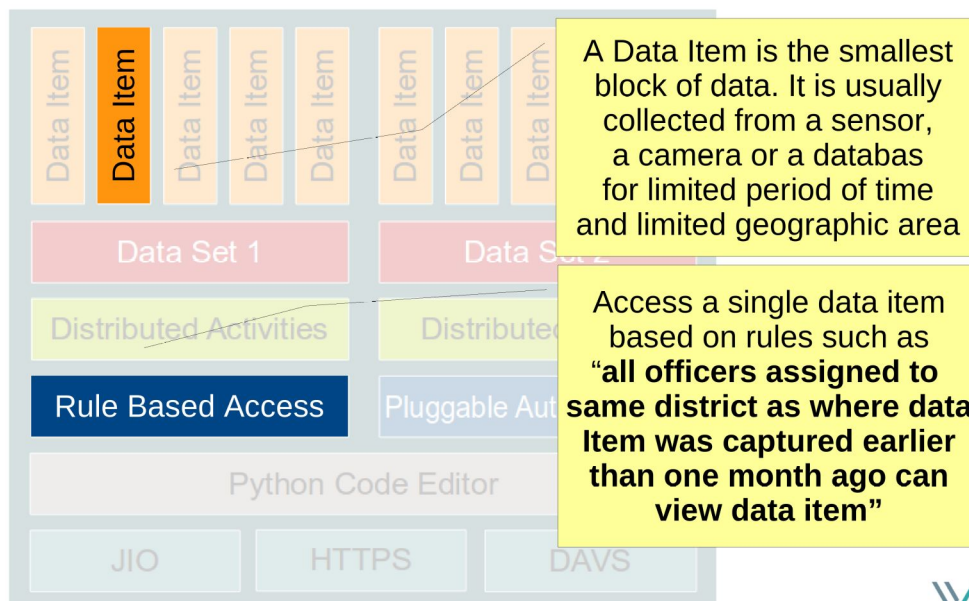
Data Encryption

I/O



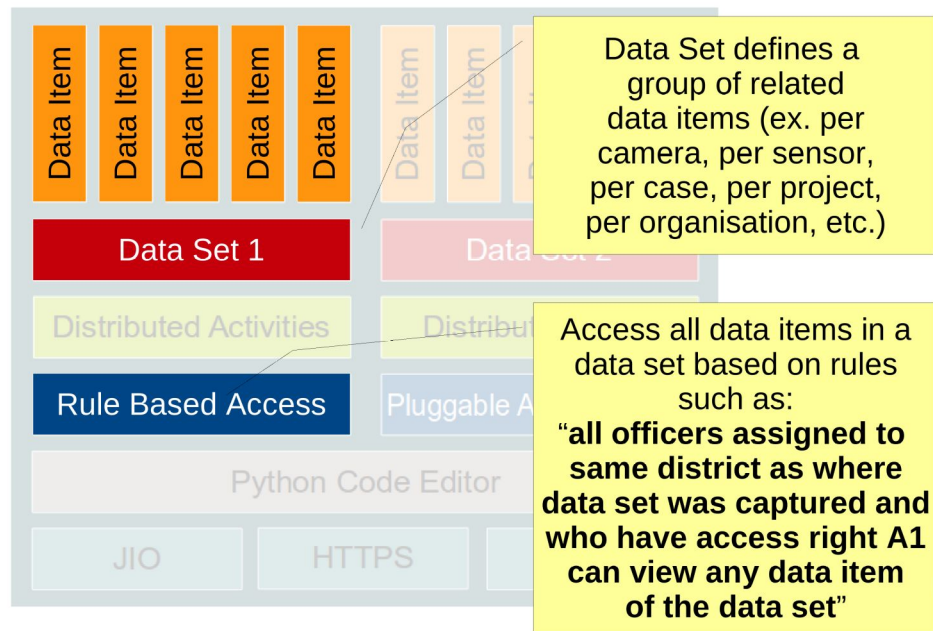
Data Access Rules

Data Item



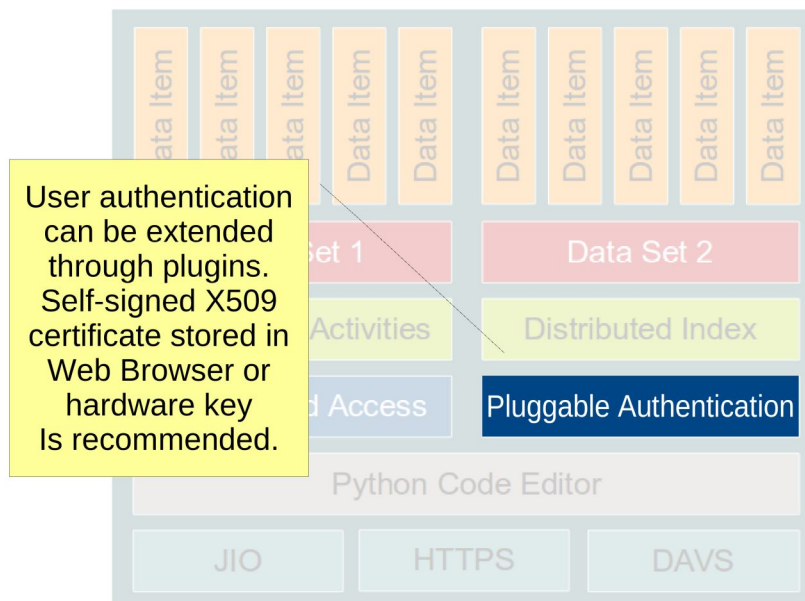
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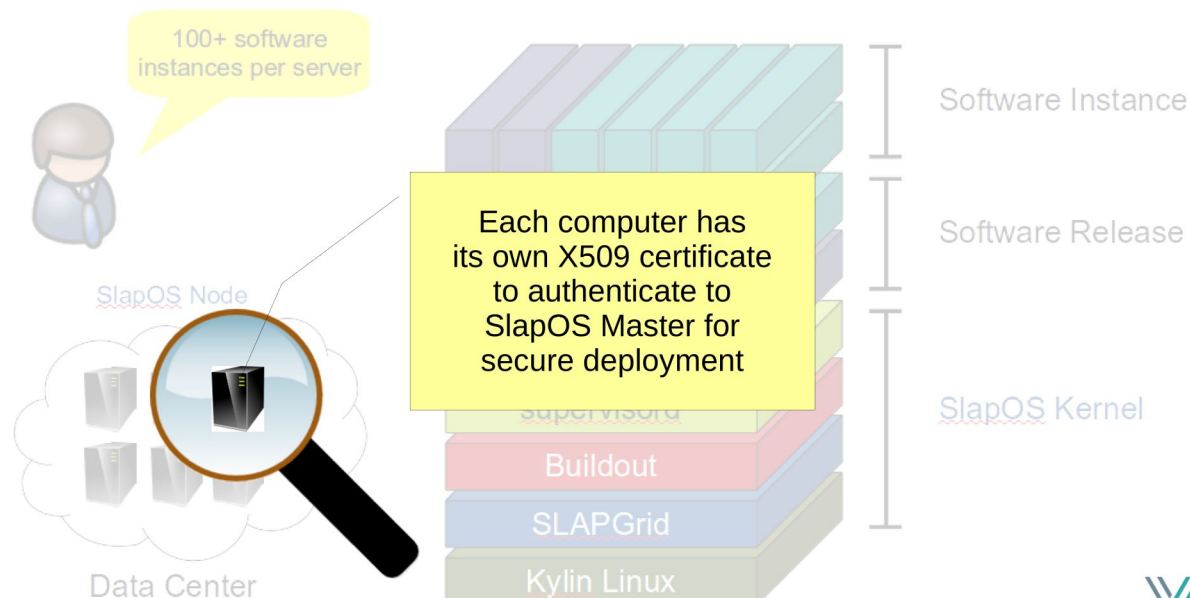
User Authentication

X509



Computer Authentication

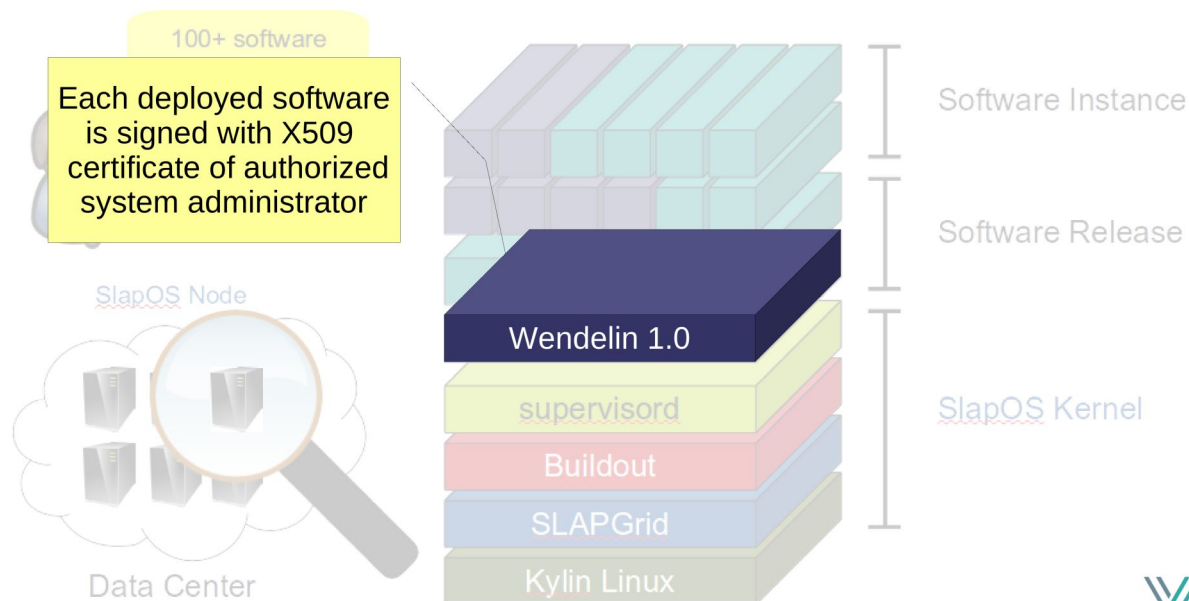
X509



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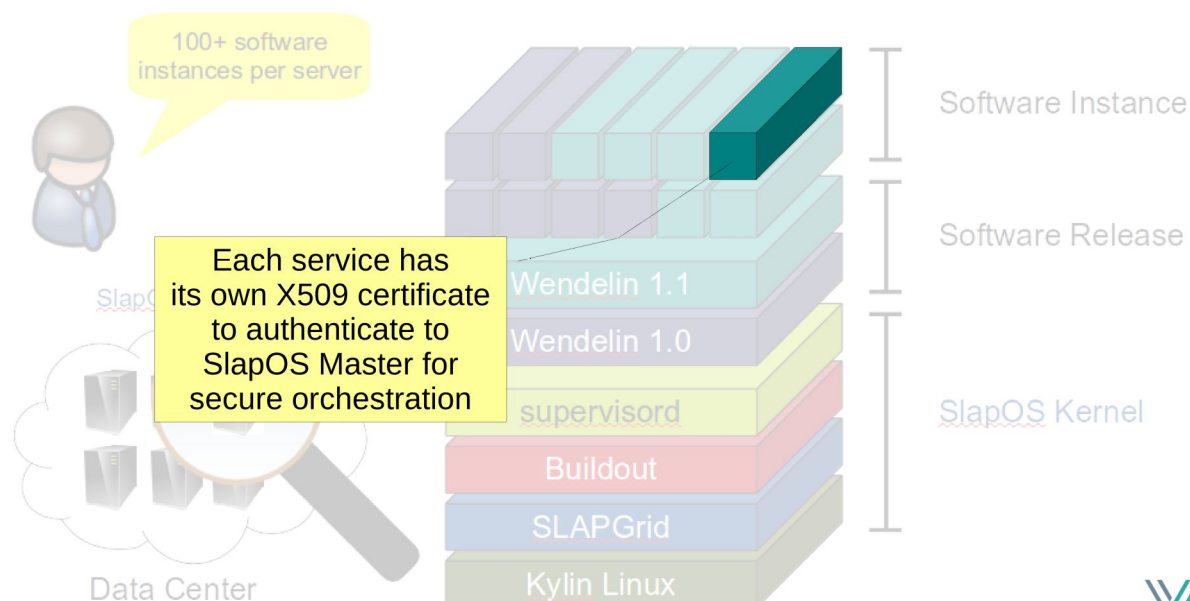
Software Authentication

X509



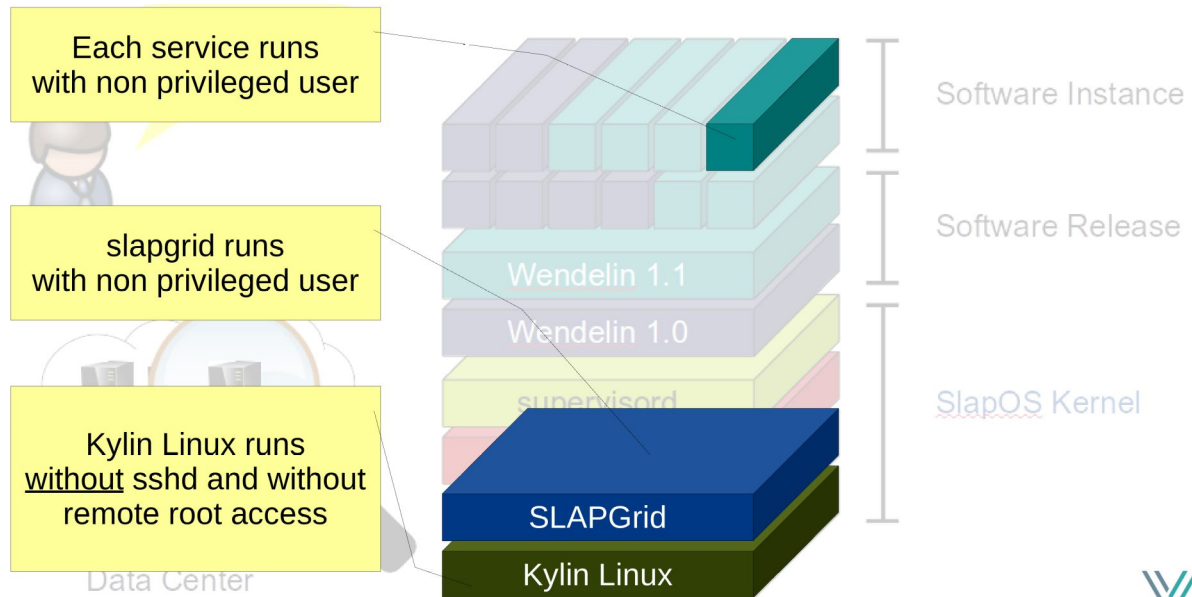
Service Authentication

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zero root



Zero Knowledge

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SlapOS Master

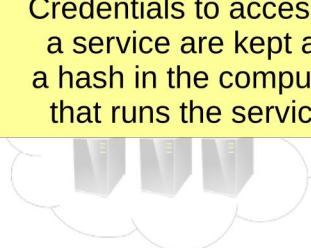
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SLAP Protocol

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SlapOS Nodes

SlapOS Nodes



Data Center 1

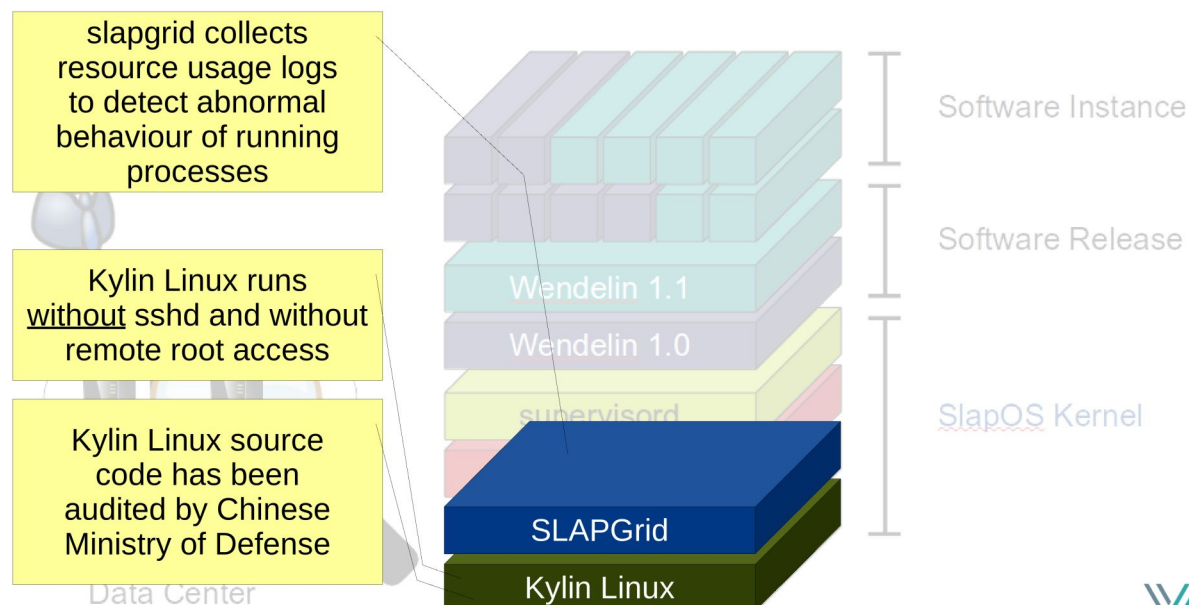


Data Center 2

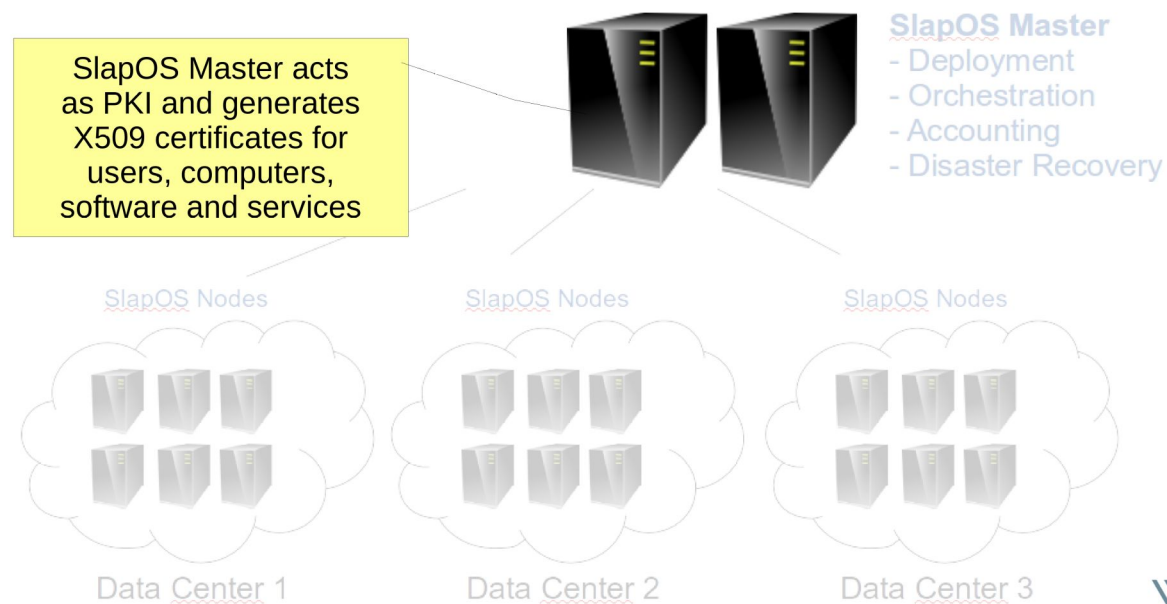


Data Center 3

Intrusion Protection



Public Key Infrastructure (PKI)



Agenda

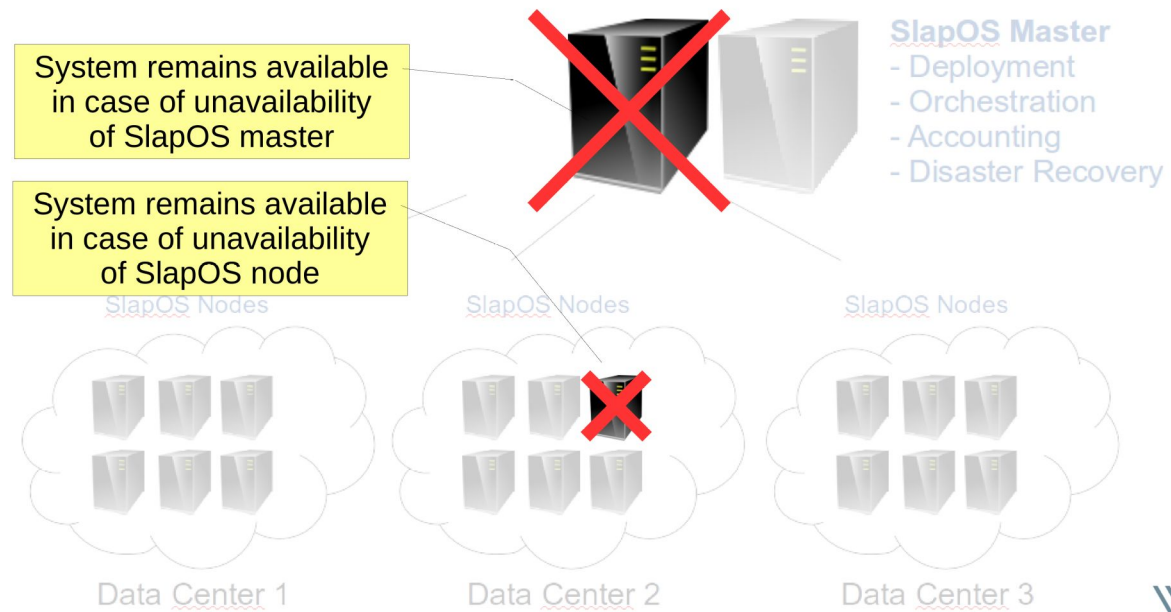
- **Architecture Overview**
- **Design Goals**
- **Security**



Safety

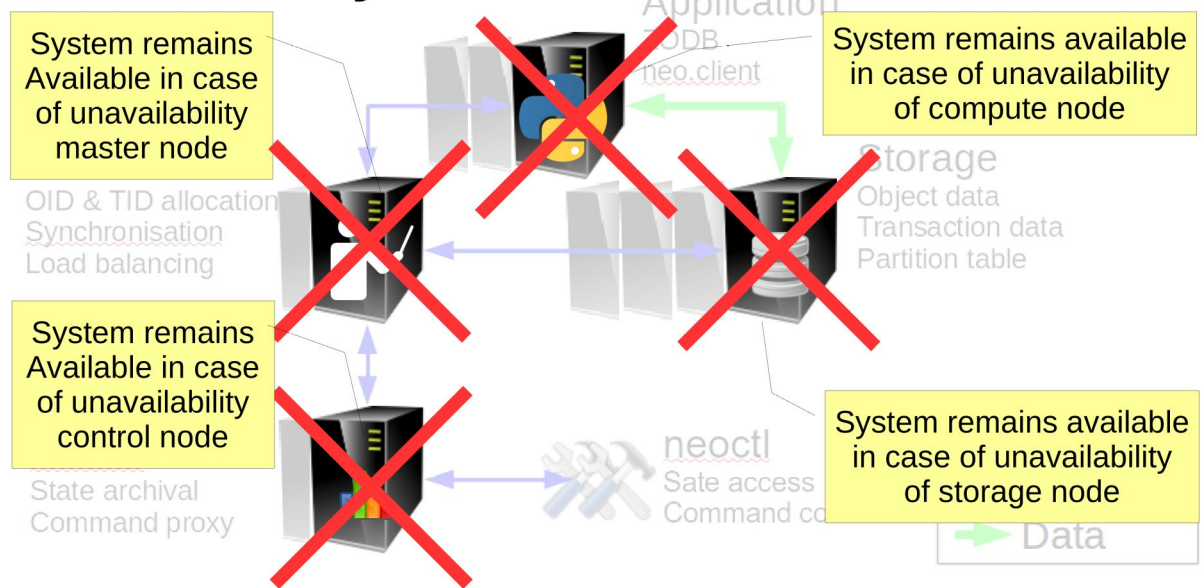
Availability

SlapOS



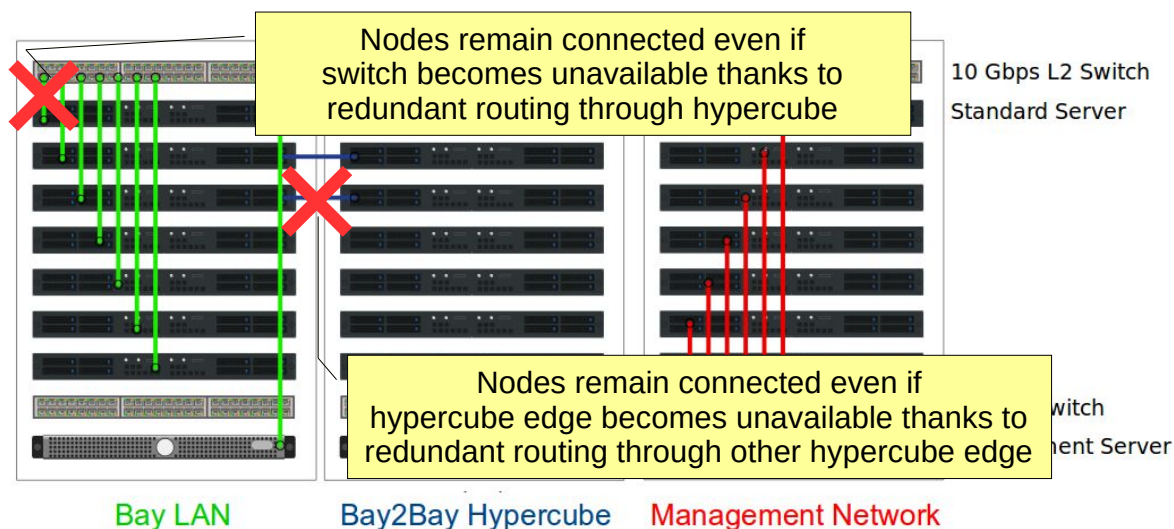
Availability

NEO



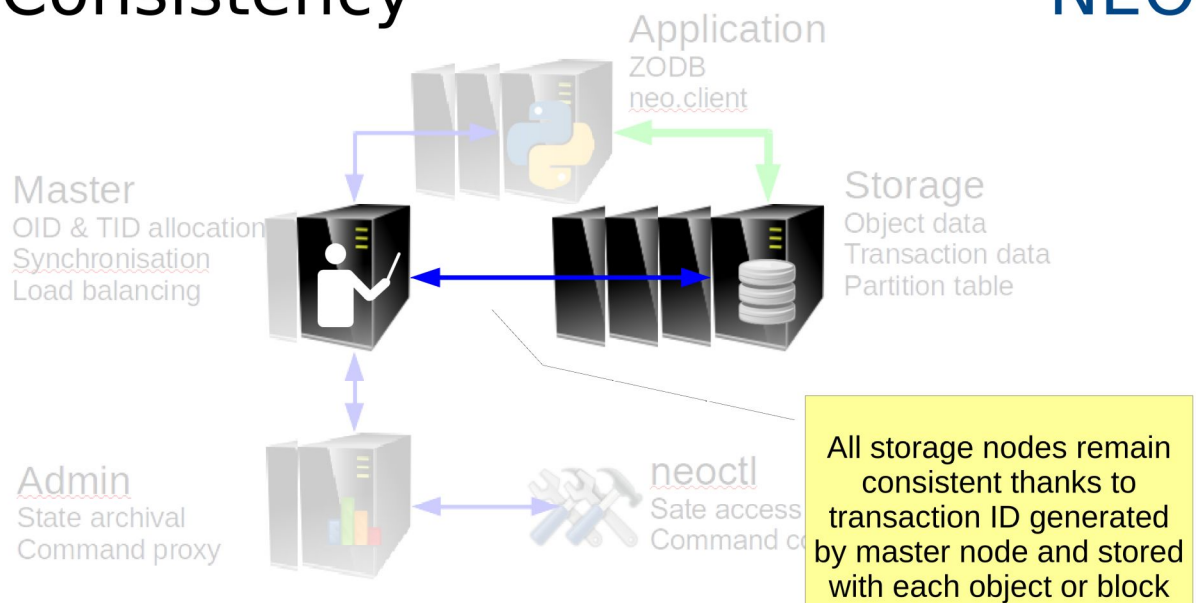
Availability

LAN



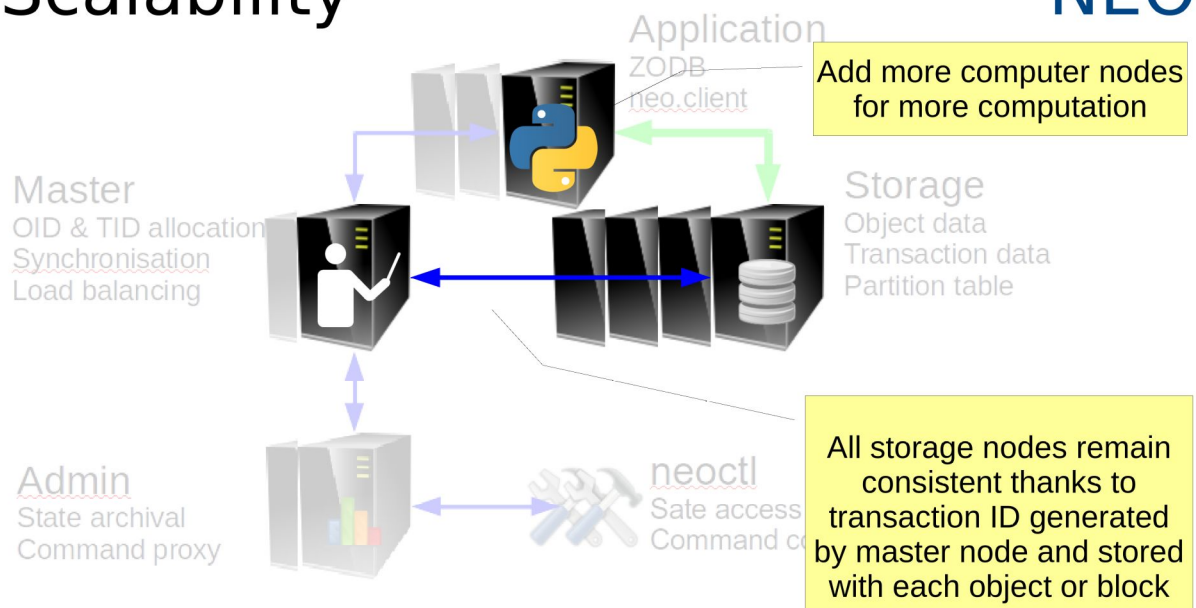
Consistency

NEO



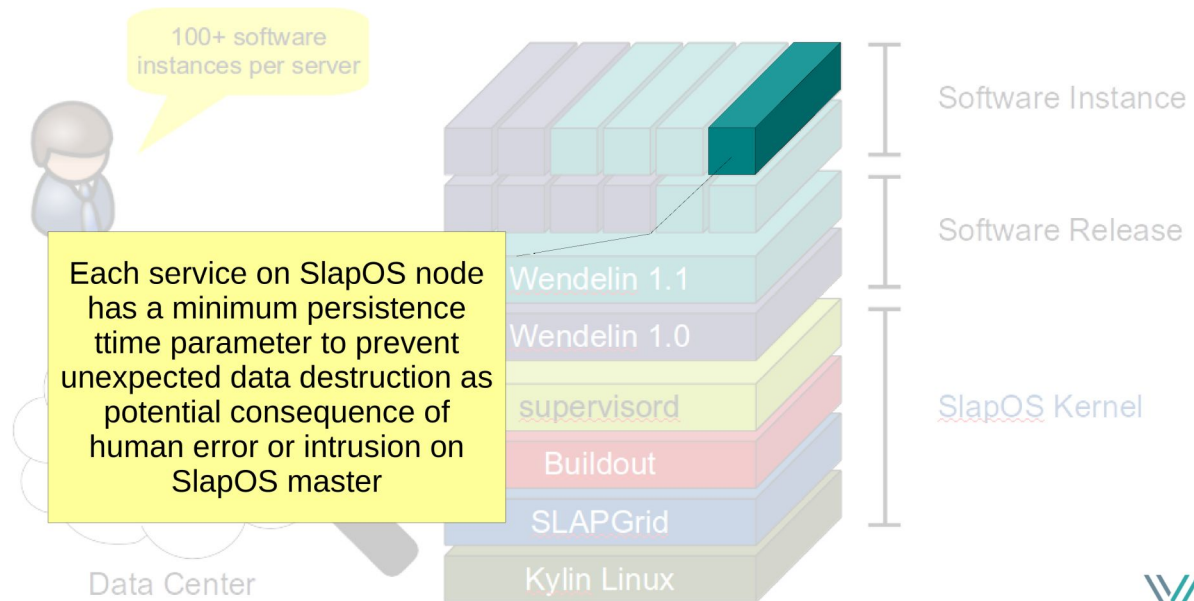
Scalability

NEO



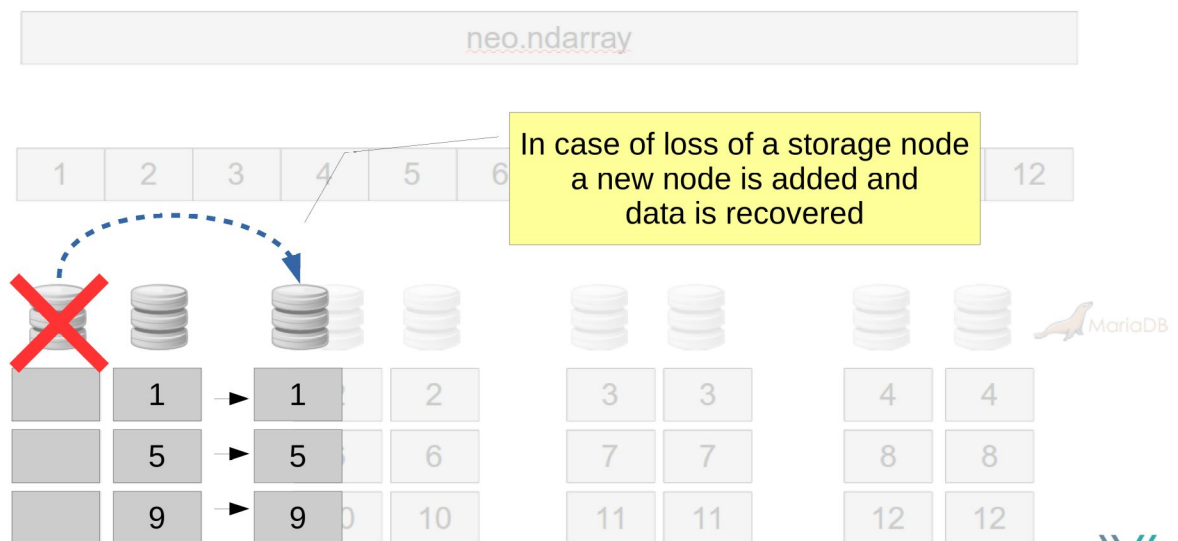
Persistence

SlapOS



Disaster Recovery

Storage



Disaster Recovery

Datacenter

