NVIDIA Omniverse on Azure

real world examples

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Agenda

- 01 Intro and Definition
- 02 Use Cases and Implementation
- 03 Azure Solution Components
- 04 How to start – what to avoid
- 05 Next Steps

Institute for Production and Informatics (IPI) Sonthofen

IPI
Institut für Produktion
und Informatik

Digitale Zwillinge und
Virtuelle Inbetriebnahme

Industrial Metaverse und
Maschinelles Lernen

- Research institute for applied science
- Since two years
- > 20 employees
- Part of the High-Tech Agenda and Digitalization Stragety of Bavaria

Prof. Dr. Bernd Lüdemann-Ravit
Prof. Dr. Frieder Heieck

Metaverse Definition

Consumer

Collaborate through gaming and online platforms

Commercial

Shared immersive experiences infused with 3D content and real-time data

Industrial

Simulate, Predict & Automate industrial processes

NVIDIA Omniverse (1st on Azure)

Microsoft 365 Applications

USD Composer | USD Presenter | Code | Replicator | Isaac Sim | DRIVE Sim | USD-GDN Publisher

Audio2Face | Application Streaming | Batch Rendering | Deep Search | Farm | Format Conversion

Generative AI | Live Editing | PhysX | Scene Optimization | ---

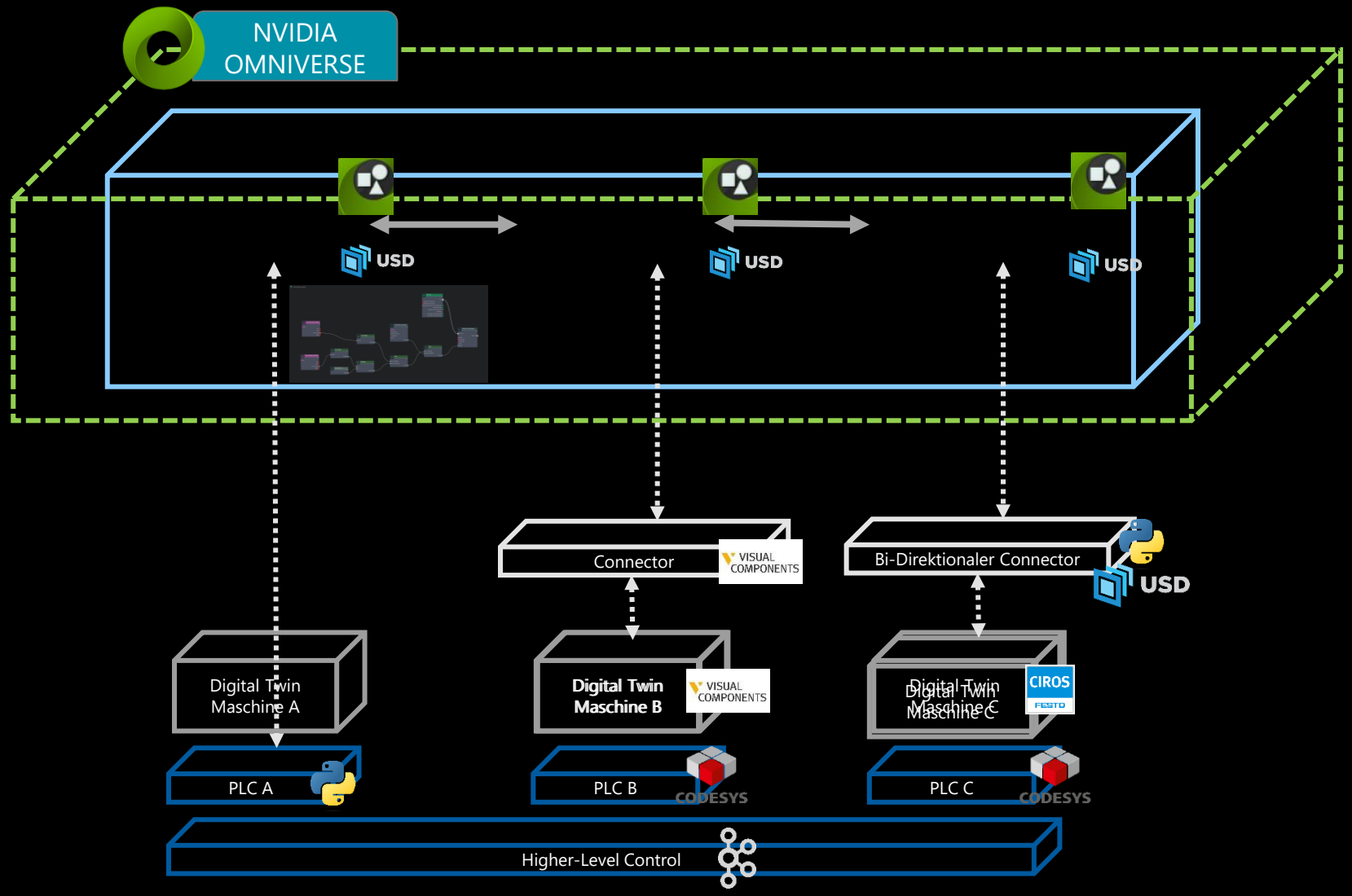
AI | Nucleus | Connect | Kit | Simulation | RTX Renderer

Accelerated Infrastructure + Azure Machine Learning + Data Encryption — Microsoft Azure

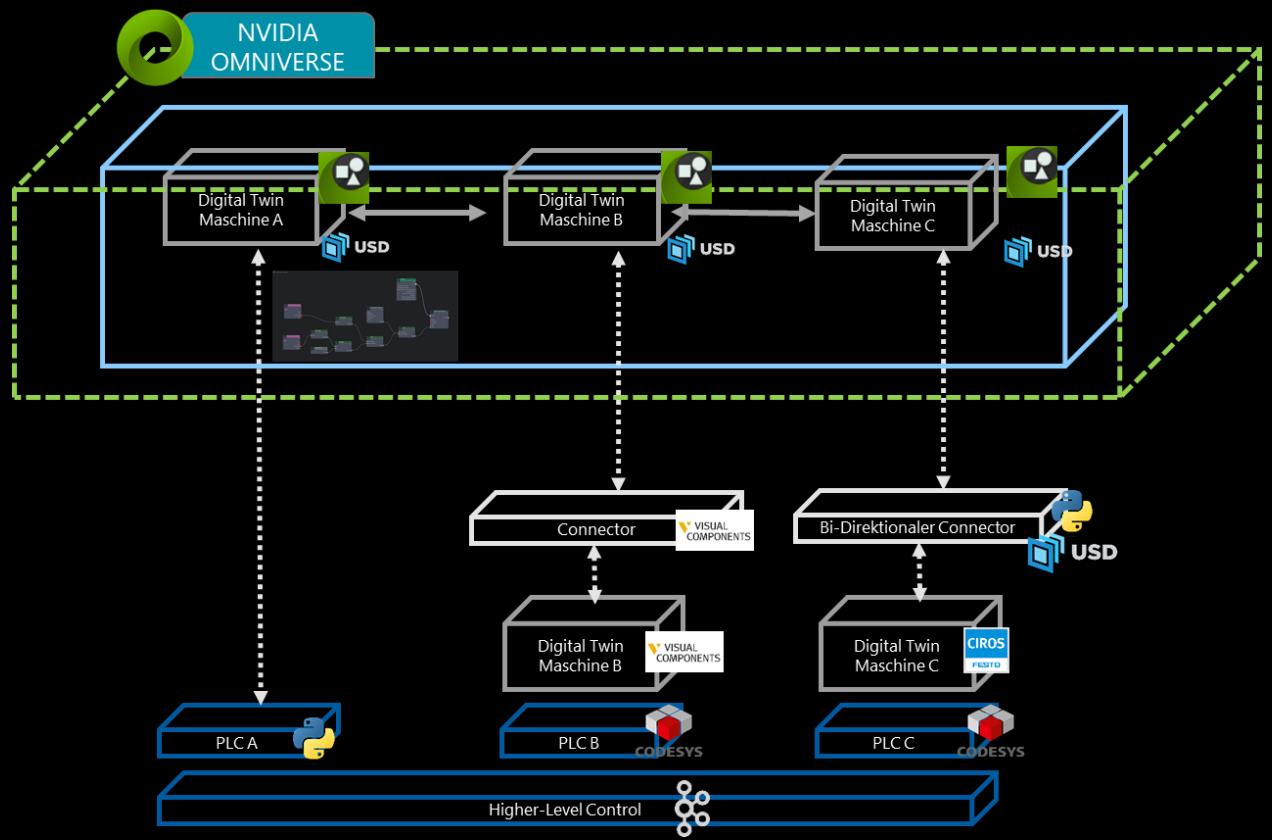
Microsoft Cyber-Security Suite

- 3D Visualization, Simulation To Bridge Physical And Digital Worlds
- Bring Together And Understand Relationship Between Siloed Data
- Training Ground For AI Models For Better Efficiency And Collaboration
- Platform To Connect Design Tools Across Industry And Ecosystem
- Interoperable And Extensible By Design

Demonstrator – Industrial Metaverse



Demonstrator – Use Case/Projects



TwinMaP

BMWK Research Project

Digitalisation for cross-industry networking

- Digital Twin
- Heterogeneous machinery
- 3D-Integrationplattform
- Asset Administration Shell (AAS)

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Research and Development

Virtual commissioning (VC) of interlinked plants in a 3D integration platform (NVIDIA Omniverse)

- *Materialflow*
- *Validation factory planning*
- *VC of MES and other systems*

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Research and Development

Training CV models using AI and synthetic data in NVIDIA Omniverse (Isaac SIM)

- Sim. depth camera (Azure Kinect)
- Artificial Intelligence
- Synthetic data
- Isaac SIM

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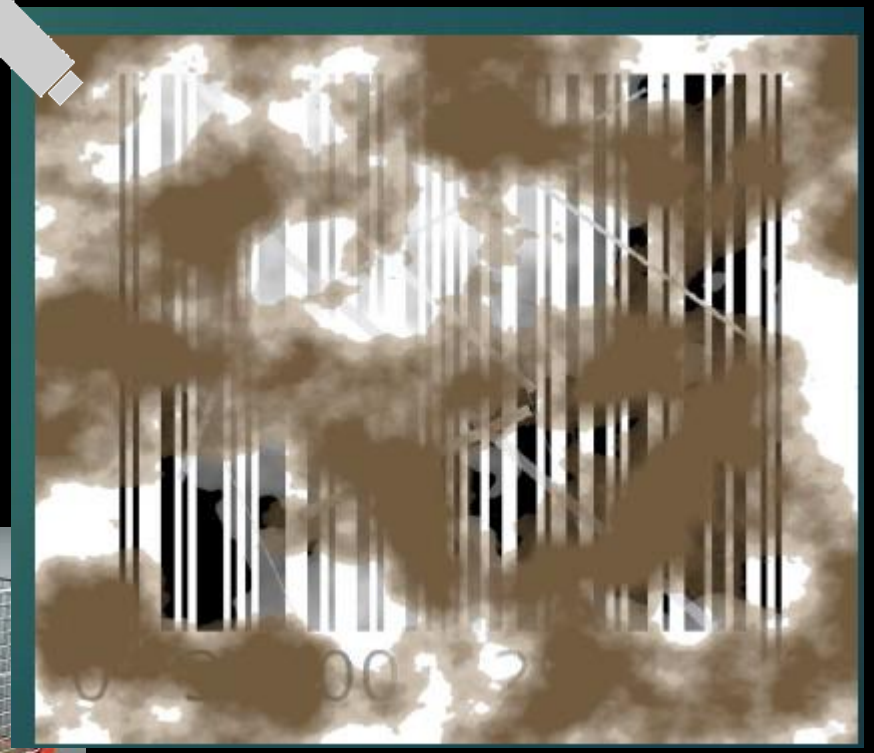
Research and Development

Bi-Direktional connector between VC-software (Ciros) and NVIDIA Omniverse

- *Universal Scene Description (USD)*
- *Data consistency*
- *Standardization*

Use Case – Synthetic Data

- AI training with synthetic image data



- Grime (e.g. dirt, oil, water)
- Scratches

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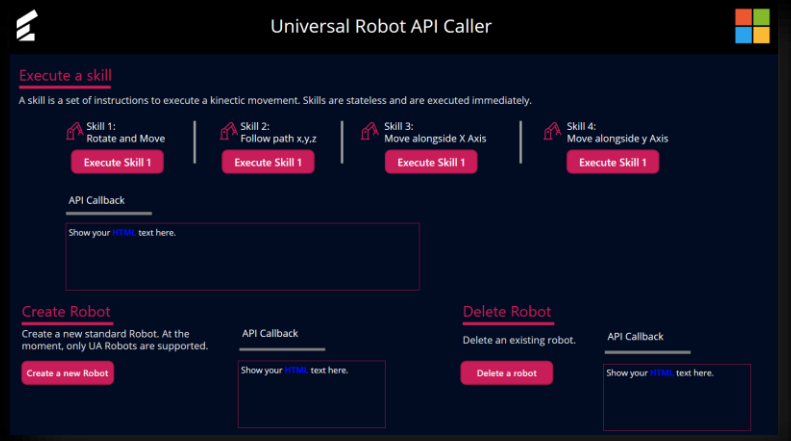
Runs on Azure – Solution Components

Azure VM – HPC: NV-Series

Azure OpenAI

AKS

One Lake



API Connection

AAD

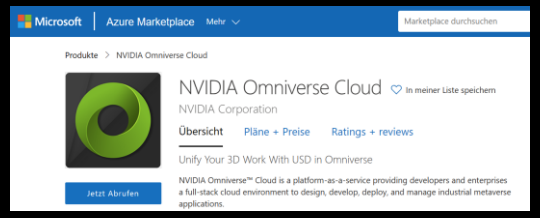
Machine Learning

... many more

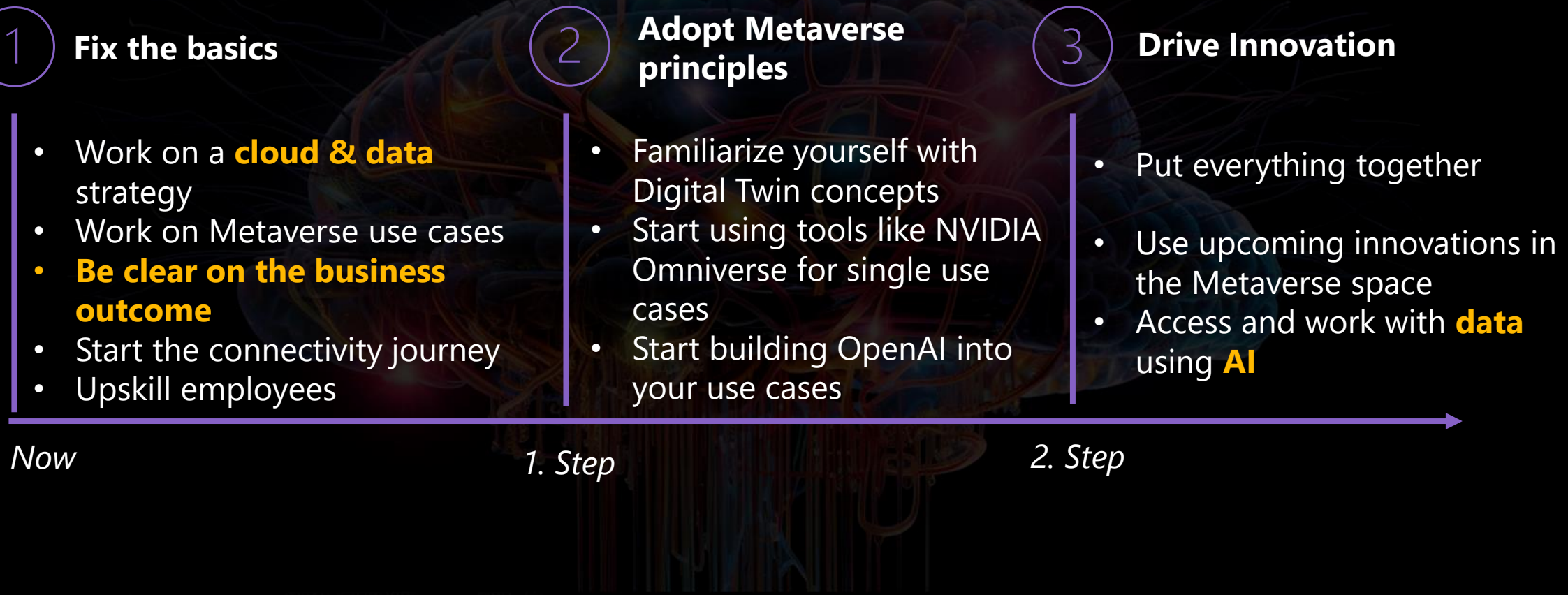
Power Apps

individual solution / architecture design

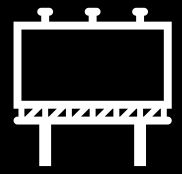
Marketplace offer:



How to start with the Industrial Metaverse



What are the most common pitfalls so far?



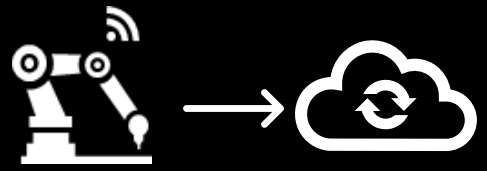
No focus on a business use case -> Focus on Technology

Focus on one use case to solve one specific problem first

E.g. Remote Employee training with real simulation data

Too many data silos

Data strategy assessment
Data Lake architecture
Data contextualisation on the shopfloor!
Do homework first
Data is the key to Digital Twin!



Too much focus on connectivity

Bottom Up approach costs too much time and money
“connect yet another machine”

Treat connectivity as commodity topic -> bring partners in!

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Thank You !!!!

Microsoft

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SESSION FEEDBACK

Session Title: NVIDA's Omniverse auf Azure - ein praktisches Beispiel

https://aka.ms/AzSum-S022