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Rethinking Connectivity

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GOTO Copenhagen
October 3,2022

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Why?

WHY?

Building a global, multi-cloud and edge aware distributed system is too hard, slow, complex and brittle, and faces security problems.

WHY?

Every impactful technology is or will be a global, multi-cloud and edge aware distributed system.

WHY?

We are at a **major** inflection point.

Cloud, HTTP and DNS will not drive the future we are heading towards.

WHY?

Innovation is driven by Technology

Every Technology is a Distributed System

Distributed is Global, Multi-Cloud, Multi-Geo, and Edge

Distributed Systems are powered by **Connectivity**

Innovation is powered by **Connectivity**

What is Connectivity?

What’s to Rethink?

The How

vs

The What

The “What”

BASICS

Ask a Question

→ Answer a Question

Make a Statement

→ Process a Statement

BASICS

Microservices

Event and Data Stream Processing

*Will evolve but not really change**

Rethinking “How”

Connectivity Pillars

Connectivity Pillars

Fundamentals

Topologies

Security

Persistence

Fundamentals

Location Independent

M:N Communications

Utility vs Silo

Self Healing

*Physical Substrate Agnostic**

Topologies

Node vs Server

Any Topology

Pervasive - Big to Small

Decentralized - No single Operator

Extensible

Security

No Keys/Passwords

Securely Multitenant

Secure Sharing between Tenants

Secure Data in Motion and at Rest

Zero Trust Constructs

Persistence

Materialized Views

Replicated

Digital Twins / Mirrors

Source Mux and Demux

Materialized Views

Single Message

Globally Ordered Set of Messages*

Key/Value Store

Object Store

Sources and Mirrors

Intelligent Digital Twins

Mux from many sources into one

Demux from one source into many

Any view (STREAM/KV/OBJ)

Any Properties

The Connectivity Pillars

Why do they matter?

Each pillar builds on the previous

Each pillar **requires** the previous

An Example

Account Details Microservice

Horizontally Scalable

Multi-Geo, Multi-Cloud and Edge

Requires local Key Value Data

< 20ms Latency WorldWide

The “How” of Today

Non-Trivial DNS (Pinning, AnyCast)

Load Balancers

Firewalls

API Gateways

Traffic Shapers

Cross Cloud Sec-Ops

Federated Deployment (K8S, Service Meshes)

Replicated Key/Value Store - Cross Cloud Providers and to the Edge

Rethinking the “How”

An Extensible Global Federated Utility - All cloud and edge providers

- E.g. Stores, Factories, Homes, Offices, Cars, etc.

Declare Intent

- Thresholds - e.g. Run up to 100 responders, 20 KV twins
- Attractors - Requests / Data
- Trust

Deploy in any system - Metal, VM, Container, WASM, K8S

Connectivity 3.0

Connectivity 3.0

- Location Independent Addressing
- M:N Communications
- Services & Streaming
- Push and Pull
- Secure by Default
- Multi-Tenancy
- Decentralized
- Intelligent Persistence
- Global Scale
- Extensible

NATS & NGS

NATS & NGS

Our take on a modern Connective & Data Mesh

OpenSource

Extensible Global Utility

All major Geos and Cloud Providers

Scalable Microservices and Streaming

JetStream Persistence (Stream, KV, OBJ)

Coming Next

Deployment driven by Connectivity

Transports and Encodings disappear

Zero Trust drives Multi-Party Exchanges

A.I. drives demand for Intelligent Connectivity

Metaverse, Industry 4.0, Smart Infrastructure..

Learn More

nats.io

rethink.synadia.com

natsbyexample.com

natsio.slack.com

Thanks!

Questions?

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