LF Edge TAC
Technical Advisory Council

15 July 2020

THE LINUX FOUNDATION

LF EDGE

Meeting Details

› July 15, 2020 (@ 7:00am PDT)
› Meeting Info:
    › Join Zoom Meeting
    › https://zoom.us/j/286673048
    ›
    › One tap mobile
    › +16699006833,,286673048# US (San Jose)
    › +16465588656,,286673048# US (New York)
    ›
    › Dial by your location
    ›   +1 669 900 6833 US (San Jose)
    ›   +1 646 558 8656 US (New York)
    ›   +1 855 880 1246 US Toll-free
    ›   +1 877 369 0926 US Toll-free
    › Meeting ID: 286 673 048
    › Find your local number: https://zoom.us/u/aeeh8taqXU

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Project/Member	Representative	Named Alternate	Project/Member	Representative	Named Alternate
Altran	Shamik Mishra	Nilanjan Samajdar	**GE Research**	Joel Markham	James Ward
Arm	Reed Hinkel	Tina Tsou	**HP Inc.**	Henry Lau	
AT&T	Kandan Kathirvel		**HPE**	Rodney Richter	Arun Thulasi
Baidu	Leding Li		**Huawei**	JianGuo Zeng	Gabriel Yuyang
Charter	Mohammad Zebetian		**IBM**	Joseph Pearson	Ryan Anderson
Dell	Trevor Conn	Sean McGinnis	**Intel**	Jim St. Leger (TAC Chair)	Emad Attia
Dianomic	Bill Hunt	Tom Arthur	**Inwinstack**	Thor Chin	
Equinix	Justin Dustzadeh		**MobiledgeX**	Vikram Siwach	
Ericsson	Torbjörn Keisu	Andrew Wilkinson	**Netsia**	Mahir Gunyel	
Fujitsu	Toshimichi Fukuda	Hatsumi Iino	**Nokia**	Tapio Tallgren	
Futurewei	Chaker Al-Hakim	Jane Shen	**NTT**	Takeshi Kuwahara	

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Project/Member	Representative	Named Alternate	Project/Member	Representative	Named Alternate
OSIsoft	Daniel Lazaro		**Akraino**	Kandan Kathirvel	Tina Tsou
Qualcomm	Lisa Lammens		**EdgeX Foundry**	Henry Lau	
Radisys	Adnan Saleem	Prakash Siva			
Red Hat	Frank Zdarsky	Thomas Nadeau			
Samsung	MyeongGi Jeong	Chi-Hyun Cho			
Seagate	Matt Shumway				
Tencent	Yachen Wang	Wei Chen			
Wipro	Subhas Mondal				
ZEDEDA	Erik Nordmark	Roman Shaposhnik			

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Topics

1. Proposed Project Advancement - Fledge: Status Update
2. Annual Review Process
3. LF IT Support Summaries
4. State of the Edge: Landscape Working Group
5. Baetyl: Project Update
6. LF Edge Publications Update
7. Upcoming Events
8. Next Meeting

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Proposed Project Advancement - Fledge: Status Update

Fledge: Stage 2 Proposal

› Proposal: https://wiki.lfedge.org/pages/viewpage.action?pageId=20940189
› Timeline/Next Steps (Process):
    › Thursday, May 21, 2020: Proposal emailed to TAC
    › Wednesday, June 3: TAC Presentation
    › --2 Week Review Period (ending Wednesday, June 17)
    › Wednesday, June 9: TAC Subgroup Review - Notes / Recording
    › Wednesday, June 17: TAC Subgroup Readout
    › Thursday, July 9: TAC Vote Approved
    › Friday, July 10: Board Vote Initiated

Annual Review Process

Annual Review Process

1. The TAC shall develop an Annual Review process to determine whether projects are in the stage that accurately reflects their needs and goals. If a project is determined to be out of place, the TAC shall provide guidance to the project in the form of recommendations towards resolving the situation. (reference)

2. Status Update: Subgroup formed to draft the Annual Review Process; last met on July 6
   a. Proposed Annual Review Process available at https://wiki.lfedge.org/display/LE/Project+Annual+Reviews

3. **Next Step:** TAC Vote to Approve the LF Edge Annual Review Process

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LF IT Support Summaries

LF IT Support Summaries

› New report providing detail around LF IT Support Tickets
› Generated monthly and posted to
https://wiki.lfedge.org/display/LE/IT+Support+Summaries

LF EDGE

State of the Edge: Landscape Working Group

SOTE: Landscape Working Group

Updates:

› Transition of Working Group Chair
› YTD Growth
› How to Contribute
› What's Next

LF EDGE

SOTE: Landscape Working Group

July 2020

SOTE: Landscape Working Group

Taxonomy

› **.Org**: Standards and collaboration groups involved in facilitating discussion by edge stakeholders of edge.
› **Traffic Routing**: DNS and software/projects to monitor and route traffic to the correct place.
› **Platforms**: Platforms focused on deploying, managing, and scaling custom-workloads at the edge (CDN & Distributed Caches, Application Delivery Network (ADN), Edge PaaS, IoT Focused, Decentralized)
› **Security**: Applications and projects focused primarily on security.
› **Networking**: Software or solutions that control the movement of packets (e.g. SD-WAN, NFV, NOS)
› **Infrastructure**: Infrastructure as a Service tools, vendors, and platforms for edge compute (Monitoring, Provisioning, Virtualization, Physical).
› **Hardware**: Physical gear, including assembled components (Core Silicon, Accelerators).
› **Edge OEMs**: Original Equipment Manufacturers (OEM) building key components critical for the edge ecosystem.
› **Wireless & Wireline**: Physical network infrastructure , protocols, & tooling focused and used at the edge (Fiber & Peering, Wireless).
› **Real Estate / Land / Data Centers**: Companies focused on building, maintaining, and operating data centers and related critical infrastructure for the edge (Tradition, Non-Traditional, Towers & Related, Municipal Right of Way)
› **Services / System Integrators**: Services for people integrating and deploying at the edge.
› **Other Edge Related Software**: Software projects /platforms common, but not specific to any of the other categories.
› **LF Edge Member Companies**: Member companies of LF Edge.

SOTE: Landscape Working Group

How to add a new listing / edit an existing entry

Github repo: https://github.com/State-of-the-Edge/lfedge-landscape

› Open a PR or issue (with edits to the landscape.yml)
› Required inputs:
  › Name of organization or technology
  › Homepage url
  › .svg logo ***Important: Only .svg format logos are accepted**
  › Twitter url
  › Crunchbase url
  › Assigned category (Descriptions for categories can be found in the README.md)

Alternate option: Email the required inputs to glossary-wg-landscape@lists.lfedge.org

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SOTE: Landscape Working Group

How to get involved

› Make sure your listing is up to date (https://landscape.lfedge.org/)
› Join the email list: https://lists.lfedge.org/g/stateoftheedge-wg-landscape
› Join the bi-weekly calls: https://lists.lfedge.org/g/stateoftheedge-wg-landscape/calendar
› Contribute to other SOTE projects:
  › State of the Edge reports
  › Open glossary of Edge Computing
› Use / Reference the landscape

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SOTE: Landscape Working Group

What's Next

› Enriched listings in cooperation with [Topio Networks](#)
› Leverage cross-project initiatives to drive awareness/participation
  › 2021 State of the Edge Report
  › Content - white papers, blog
  › PR / Media

Molly Wojcik
Chair of State of the Edge Landscape
Working Group

molly@section.io

Matt Trifiro
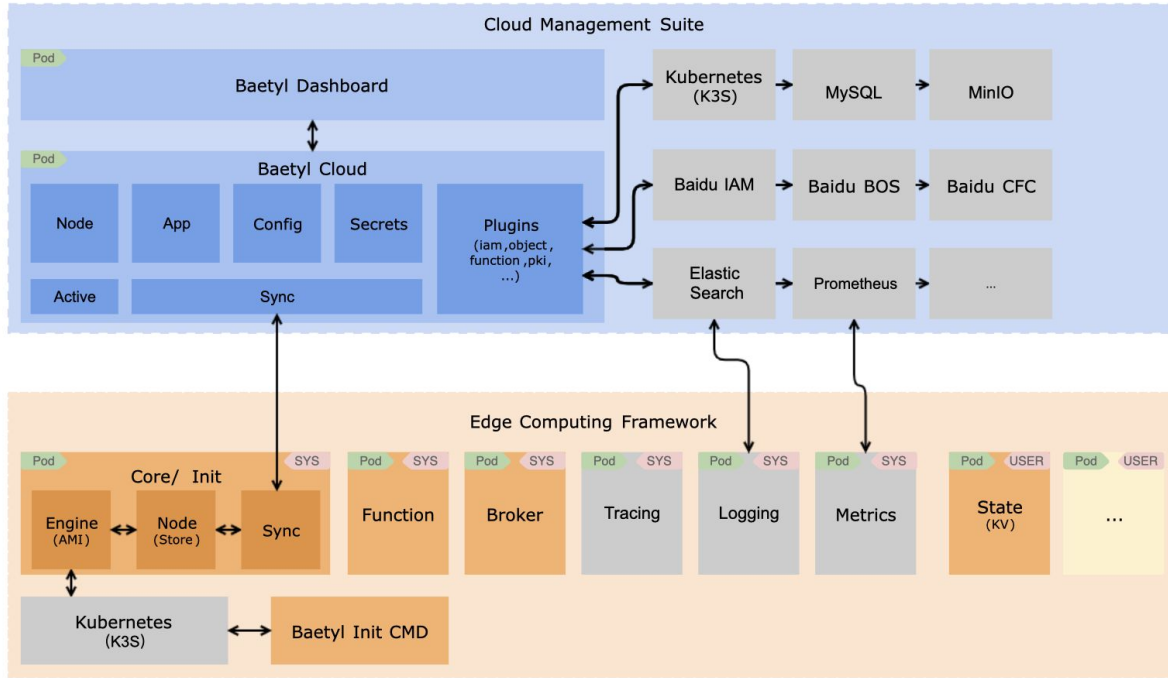Co-Founder & Chair of
State of the Edge

matt@vapor.io

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Baetyl: Project Update

A combination of Edge and Cloud Native

› Unify management
    › Kubernetes has been the de facto standard of cloud
    › Strong demand for remote management of edge
    › Merge edge node into Kubernetes schedule resources

› Support edge cluster
    › Replace custom servers with stacked edge box
    › Leverage the load balancing and failover capabilities provided by Kubernetes
    › Cloud-Edge synchronization is the key issue under weak network

› Application with multiply services
    › Service, Pod & Container
    › Service Mesh, Istio works

Kubernetes Mode

Cloud Management Suite

Pod

Baetyl Dashboard

Pod

Baetyl Cloud

| Node | App | Config | Secrets | Plugins (iam,object, function ,pki, ...) |
| Active | Sync | | | |

Kubernetes (K3S)	MySQL	MinIO
Baidu IAM	Baidu BOS	Baidu CFC
Elastic Search	Prometheus	...

Edge Computing Framework

Pod **Core/ Init** SYS

| Engine (AMI) | Node (Store) | Sync |

Pod SYS **Function**

Pod SYS **Broker**

Pod SYS **Tracing**

Pod SYS **Logging**

Pod SYS **Metrics**

Pod USER **State (KV)**

Pod USER **...**

| Kubernetes (K3S) | Baetyl Init CMD |

Baetyl Cloud Modules

Baetyl Edge Modules

Third Part Modules

Pod ▸ App runs in K8S Pod

SYS ▸ App runs in system namespace , app is configurated by baetyl system

USER ▸ App runs in user namespace , app is configurated by user

Key Update

Baetyl-Cloud
A remote management system

Shadow CRD
A cloud-edge sync protocol
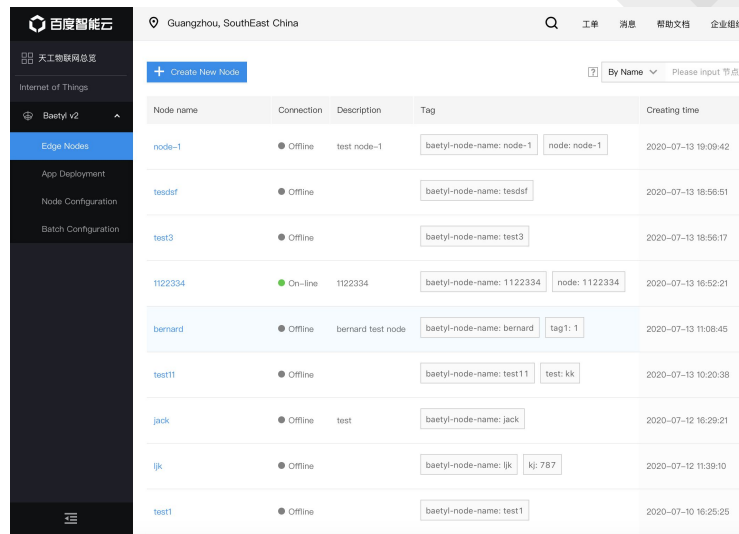
Kubernetes backend
A self-updatable model

Baetyl-Cloud

› Code repository: https://github.com/baetyl/baetyl-cloud/

› Image repository: hub.baidubce.com/baetyl/cloud:v2.0.0

› Install & Start: helm install baetyl-cloud

› Free playground:
  › http://106.12.34.129:30494/, WIP: dns and en-US

› Features
  › Node management: CRUD, status, tag
  › Application deployment
  › Configuration for nodes, functions, secrets, etc
  › Batch management, pre-defined box firmware

› Interface
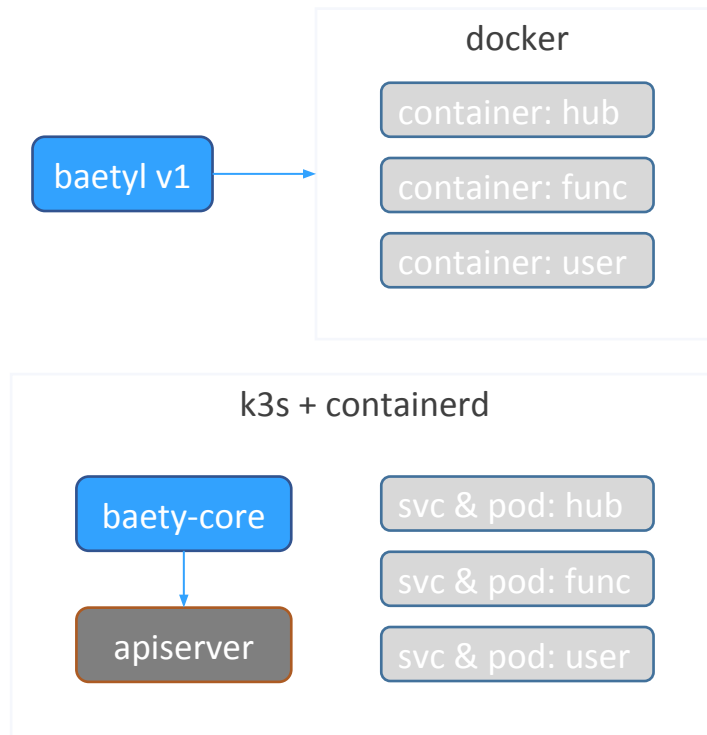 › OpenAPI, no GUI
  › WIP: kubectl CLI integration

Shadow CRD

› Edge-Cloud Sync
   › Collect edge status into cloud
   › Deploy app & data to edge
› Key issue: network quality
   › QoS over weak network
   › Device Shadow protocol
   › Exchange report/desire pack
› WIP
   › MQTT over WebSocket
   › K8S Operator

Cloud side

k8s
apiserver — k8s deployment

strong
link

baetyl-cloud — pack/unpack shadow

weak
link — report/desire

baetyl-core — unpack/pack shadow

strong
link

k8s
apiserver — k8s deployment

Edge side
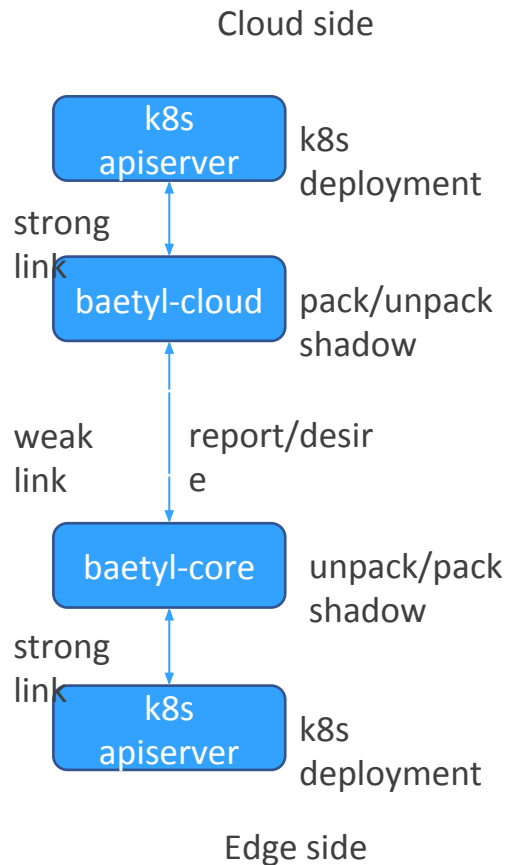
Kubernetes backend

› Move "baetyl" program into container
  › baetyl-core
  › Translate baetyl-cloud API into K8S API
  › Sign certification for each service
  › WIP: debug console attach to Pod
› Enhanced application model
  › Define Service with Pod and replica
  › Dedecated Deployment
› Edge cluster
  › Default with K3S + containerd
  › Multiple instances on different box

docker

baetyl v1 →
- container: hub
- container: func
- container: user

k3s + containerd

baety-core → apiserver
- svc & pod: hub
- svc & pod: func
- svc & pod: user

Q & A

LF Edge Publications Update

› Recently posted, available under
https://www.lfedge.org/resources/publications/
  › Akraino Edge Stack APIs
  › Sharpening the Edge: Overview of the LF Edge Taxonomy and Framework

Upcoming Events

Upcoming External Events

› Edge Woman of the Year 2020: 1 July - 10 August, 2020
  › Submissions Close August 10: https://www.lfedge.org/event/edge-woman-of-the-year-2020/
› Open Networking & Edge Summit North America: 28-29 September, 2020 - Virtual
  › ONES Unconference Track
› Open Source Summit Europe: 26-28 October, 2020 - Dublin, Ireland
  › CFP Closes July 26:
    https://events.linuxfoundation.org/open-source-summit-europe/program/cfp/
› KubeCon/CloudNativeCon North America: 17-20 November, 2020 - Virtual
› IoT Solutions World Congress: 11-13 May, 2021 - Barcelona, Spain

› Discussions around upcoming events occur in the LF Edge Outreach Committee
› Members may subscribe at: https://lists.lfedge.org/g/outreach-committee

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LF Edge Webinar Series

› Akraino Edge Stack
  › [Your Path to Edge Computing with Akraino Edge Stack](#)
  › Held Thursday, April 2
  › On-demand recording available at: [https://zoom.us/webinar/register/WN_Zjdo4-5fTQSIqH7pL8iHrQ](#)

› EdgeX Foundry
  › [EdgeX Foundry 101: Intro, Roadmap and Use Cases](#)
  › Held Thursday, April 23
  › On-demand recording available at: [https://zoom.us/webinar/register/4515850788014/WN_xCd6YPjEQrCwLiFhBWPKug](#)

› Project EVE
  › [Building the "Android of the IoT Edge"](#)
  › Held Friday, May 29
  › On-demand recording available at: [https://zoom.us/webinar/register/6415888722675/WN_35oZJ3hrQE69snMaiJUTPg](#)

› [Demystifying the Edge with the new LF Edge Taxonomy and Framework](#)
  › Held Thursday, July 9
  › On-demand recording available at: [https://zoom.us/webinar/register/WN_icv5h6wFTcuw9O0xvMpgLw](#)

› More to follow…

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Upcoming Project Events

- › EdgeX Challenge Shanghai 2020
  - › Launch Date: July 3rd, 2020 / End Date: October, 2020
  - › Location: Shanghai + Online
  - › Organizer: Linux Foundation APAC and Science & Technology Commission (STCSM) of Shanghai Municipal Government
  - › Sponsors: Intel, VMware, InnoSpace, Dell Technologies, Thundersoft
  - › Supporting Organizations: CCFA (China Chain Store & Franchise Association), Tencent, IOTech
  - › Tracks:
    - › Commercial (Retail, Hospitality, Banking, Education, etc.)
      - › Using EdgeX, based on IOT, AI and data analysis technologies, build innovative applications related to consumer, merchandise, and store.
      - › Use EdgeX to build multi-sensor correlated IoT applications.
      - › Use EdgeX to build applications beneficial to defeat COVID-19.
      - › Combine EdgeX with 5G, blockchain or service robot to build innovative applications
    - › Industrial (Factories, Power, Oil/Gas, Utilities)
      - › For the multi-edge node scenario, build an SDN + containerized IT solution based on EdgeX
      - › In discrete or process (with lower latency requirements) manufacturing, use EdgeX to achieve low latency fault detection and response on the production line
      - › In Discrete Manufacturing, use EdgeX to Detect Product Defects Online
      - › Using EdgeX to collect data, proceed with energy management of electric/gas/coal/oil, to improve energy efficiency. (Such as: building a thermodynamic model, completing heat meter data collection and automatic valve opening control to optimize heating efficiency)
      - › Using EdgeX to realize remote unmanned monitoring of multiple data sources and automatic control of the on-site environment.

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Linux Foundation edX and Training Courses

› Business Considerations for Edge Computing:
https://www.edx.org/course/business-considerations-for-edge-computing

› Getting Started with EdgeX Foundry (LFD213):

https://training.linuxfoundation.org/training/getting-started-with-edgex-foundry-lfd213/

Next Meeting

Next Meeting

› Next Meeting: Wednesday, July 29 @ 7am PDT
 › Akraino R3 Release?

Thank You

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Resources

Project Resources: Getting Started Checklist

1. https://wiki.lfedge.org/display/LE/Technical+Project+Getting+Started+Checklist
2. Best Practices Guide for new, and existing, LF Edge Projects to define/refine/enhance their Project Management
3. Will be sent to Project TSC Leads for additional input / examples
4. Welcome feedback in the TAC as well

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LF Edge TAC - Focus Areas for 2020

Target areas identified for the TAC to direct focus, beyond PLD/Project Review

1. **Architecture (Tech > LF Edge) - Output: TBD (*White paper?*)**
2. APIs Document, Align and Publish
3. SDO/Consortiums expansion
4. **Forcing function - Use Case or Deployment > Demo across all projects**
5. Technical overlap/unification
6. Cross Project Collaboration
7. IT Efficiencies

Out of Scope for the TAC (for now)

1. Vertical Solutions (End User / SIG Program)
   a. At Board/SPC level

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LF Edge TAC Projects / PLD Update - Pipeline

Note: Projects listed below have indicated some level of interest since Project Launch.

› Coaty (Siemens) (*invited August 21, 2019; targeting Q1*)
› Flogo (Tibco)
› Open19 (via Vapor.io)
› Wormhole (OSS name Flowgate)

› Rafay (Rafay Systems)
› Project Sandstar (Anka Labs, Inc.)
› Synse (Vapor.io)
› Cisco IoT/Agribusiness OS Project (Cisco)
› infinimesh (infinimesh)