Thomas Patrick Downes

Skills

- Public speaking at variety of technical levels
- Identity management via SAML federation
- Administer and support HTCondor clusters
- Terraform creation of AWS/GCP infrastructure
- Management of kubernetes cluster on EC2
- Delegated RBAC access to `k8s` cluster for staff
- Traefik-based highly available web proxy
- Python/shell/C/C++/Java/Go
- Continuous integration/deployment via GitLab
- Configuration automation via Puppet, Chef
- Operation of VMWare cluster
- High availability networking and firewall
- Operation of highly available storage area network
- High performance cluster operation (6,000 cores)
- Large-scale filesystem (ZFS) management
- Manage equipment acquisition and support (>$1M)

Experience

2019–present **Professional Services HPC Cloud Consultant**, *Univa Corporation (Chicago, IL)*
- Facilitate installations of Navops Launch, a rules-based automation engine and cost-management tool for bursting Univa Grid Engine (UGE) into major cloud providers.
- Create Infrastructure-as-Code solutions that can be maintained by customers.
- Lead customer demonstrations in series of Meetups to promote Navops Launch.
- Created Consul-based solution to burst several thousand UGE nodes on GCP in 5 minutes.

2015–2019 **Senior Scientist**, *Center for Gravitation, Cosmology and Astrophysics (Milwaukee, WI)*
- Supervise a team that provides services in support of LIGO research including software integration/containerization, distributed access to data, wikis, and database portals.
- As Co-Investigator, contributed to the development of several grant applications, including a successful NSF award for a $900k upgrade of NEMO computing cluster.
- Manage group's relationship with campus information technology staff to ensure that its infrastructure and security requirements are met.
- Lead LIGO's relationship with developers of the HTCondor cluster orchestration software.
- Re-designed analysis portal from self-hosted to highly-available solution using Kubernetes on Amazon/EC2 that will ensure successful low latency communication necessary for multi-messenger astronomical observations.
- Continued duties listed under succeeding section.

2012–2015 **Associate Scientist**, *Center for Gravitation, Cosmology and Astrophysics (Milwaukee, WI)*
- Lead team responsible for computing services in support of LIGO and CGCA researchers.
- Provide Icinga-based monitoring / alerting solution for LIGO's computing services.
- Responsible for managing maintenance and operations budget for the group's data center, including electrical/cooling systems and all contractor supervision and bid solicitation.
- Responsible for the execution of the NEMO cluster, a 6,000 CPU-core & 50,000 GPU-core computing resource on which to detect and analyze multiple sources of gravitational waves.
- Designed, installed, and maintained group's VMWare platform and storage area network.
- Developed expertise in configuration automation, virtualization, large-scale storage technologies and SAML federated identity management.
- Serve on collaboration committees and working groups to establish computing policies.

2002–2011 **Graduate Student**, *The University of Chicago* and **Research Associate**, *Caltech*
- Deploy astronomical instruments in Hawaii/Chile and analysis of noise-dominated data

Education

2002–2009 The University of Chicago, Kavli Institute for Cosmological Physics
PhD Physics, MS Physics

1997–2002 University at Buffalo – The State University of New York
BS Physics, BS Computer Science, minor mathematics *summa cum laude*

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