TECHNOLOGY OVERVIEW

The cloud-based Synapse software from Kinetic Buildings (www.kineticbuildings.com) offers a flexible, scalable, and cost-effective monitoring-based commissioning (MBCx) tool that features automated fault detection and diagnosis (AFDD), improved equipment scheduling, and optimized HVAC equipment temperature and pressure setpoints. Its peak demand reduction and load shedding functions are enabled through internal load control algorithms and utility demand response signals. Load shifting opportunities are identified through predictive modeling of building loads and thermal mass combined with thermal energy storage and optimal HVAC start for pre-cooling and heating. It also features virtual equipment submetering, predictive modeling of equipment and energy use, and cross-comparison of operation across different timeframes for M&V. The tool incorporates the VOLTTRON platform to enable bi-directional communications with a variety of protocols – including standards-based messaging ADR protocols such as OpenADR.

The tool can apply to all commercial buildings in most geographical areas, as long as the building as a modern BAS with networked control capabilities.

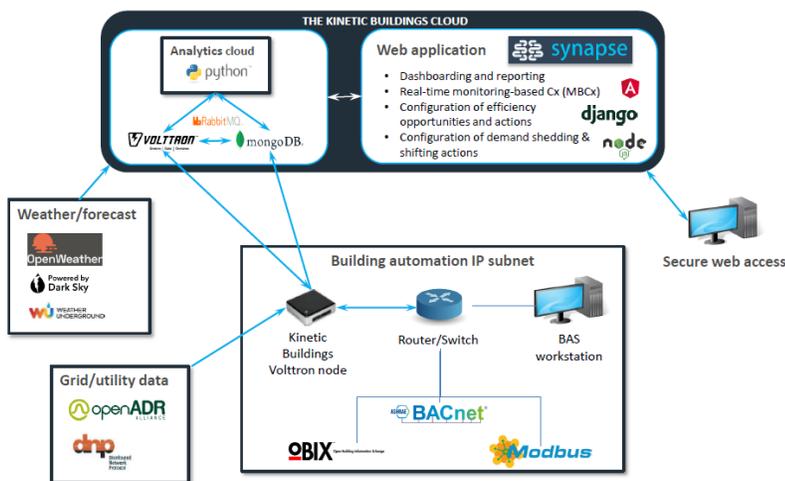### Physical architecture

What is GEB?

Grid-interactive Efficient Buildings (GEB) are energy-efficient buildings with smart technologies characterized by the active use of distributed energy resources (DERs) to optimize energy use for grid services, occupant needs and preferences, and cost reductions in a continuous and integrated way.

FIELD VALIDATION SITES

Cesar E. Chavez Memorial Building. Image courtesy of GSA, photo by Fred J. Furmeister, Time Frame Images.

GSA Site: Cesar E. Chavez Memorial Building

- **Location:** Denver, CO
- **Area:** 199,258 sq. ft.
- **Utility:** Xcel Energy
- **Fuel Types:** All-electric
- **DERs On-Site:** 105 kW Solar PV
- **Expected GEB strategies:** Energy efficiency, load shed, load shift involving temperature and pressure setpoints, staging of electric resistance reheat, strategic integration of PV, and LED lighting control management.

Commercial Site TBD