

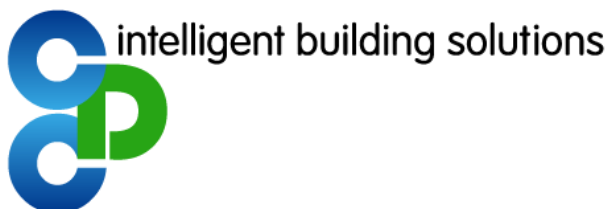
Welcome to a world where technology flows  
through the heart of your business environment

Welcome to CDC



# Integra the platform

Powered by **Integra™**





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## Introduction to CDC Integra™

CDC Integra™ is an information & control supervisor software platform that connects to building sub-systems on medium to large sites, either locally or over a wider area network, to form a completely integrated intelligent management solution for all types of facilities.

The CDC Integra™ software platform offers a uniquely flexible interface and control system, designed to allow for integrated communication and operational control between the different sub-systems that support the operation of any type of facility. All types of facility sub-systems are presented in an easily comprehensible graphical format to integrate all operational management services into a single control environment. The solution operates across, and groups together, management solutions for:

- Heating, Ventilation and Air Conditioning (HVAC).
- Lighting and shade.
- Environmental Monitoring and climate control.
- Energy management and carbon reduction.
- Physical and site access security.
- CCTV and Digital CCTV recording.
- Fire, Life and Safety systems.

CDC Integra™ is designed to monitor field equipment over an IP network and other transmission media (e.g. PSTN, ISDN, and WAN data services).

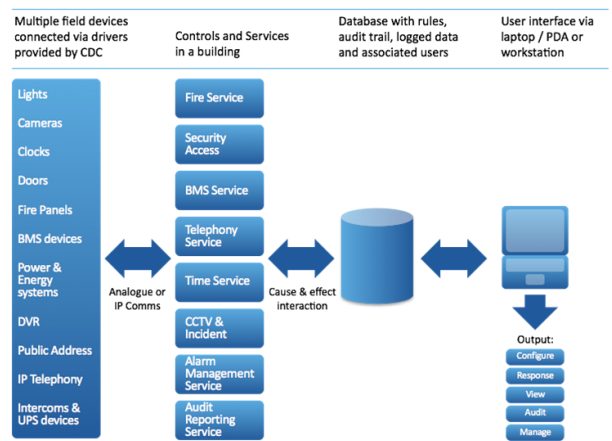
Versatility is the key to the CDC Integra™ concept. Instead of attempting to make building sub-system manufacturers adopt a standard, its success as an approach to system integration lies in being sufficiently flexible to adopt whatever communications media and protocols are already employed.

CDC's approach is to integrate the building sub-systems at the "front-end" (user-interface end), so that the functional autonomy of the individual sub-systems is unaffected. This preserves confidence in the independent operation of all the sub-systems. Each sub-system connects via an interface module to the Integra software.

## The CDC Integra™ configuration

The CDC Integra™ software platform has four major components:

1. The CDC Integra™ Central Management Server which controls the operation of CDC Server Services applications.
2. The CDC Integra™ Server Services applications each of which have a clearly defined role in terms of the discipline or function to which they relate. In general they all manage the information flow for a particular discipline (such as BMS, Fire, Security, CCTV etc) and apply discipline-specific rules to maintain the integrity of the systems for which they are responsible.
3. The CDC Integra™ Graphical Supervisor offers a flexible workstation interface that allows for communication between different manufacturers' sub-systems. It presents information and control facilities to the operator in an easily comprehensible graphical format.
4. The CDC Integra™ Interface Library provides Satellite Communications Drivers to function on the Network Interface Unit (NIU), the hardware connected to each of the building sub-systems. The satellite communication drivers are responsible for converting read, write and alarm requests between the proprietary data formats used by the different manufacturers' sub-systems and the standard data formats used by the Central Management Server.



## The CDC Integra™ Central Management Server

The CDC Integra™ Central Management Server controls the operation of CDC Server Services applications. Data is retrieved from each of the connected sub-systems and a pre-defined rule set is applied to the management of this information. These rules include prioritisation and cause & effect mechanisms.

It employs a two-tier structure, such that the integration function is made between the Server Services, and not directly between the interface or sub-system data sources. This ensures that any actions taken on one sub-system cannot undermine the operation of another.

The Central Management Server is coupled with an SQL database for automated logging and reporting, and a Web Services server that provides an interface for connectivity to many corporate ERP or other analytical & reporting systems for performance analysis.

## The CDC Integra™ Server Services applications

The CDC Integra™ Server Services applications each have a clearly defined role in terms of the discipline or function to which they relate. In general they all manage the information flow for a particular discipline (such as BMS, Fire, Security, CCTV etc) and apply discipline-specific rules to maintain the integrity of the systems for which they are responsible.

### The core Server Services applications available are:

#### Alarm Management Service

This service receives alarms and allocates them into a prioritised alarm list, which can be viewed on any operator workstation. It also builds a Response Plan for each received alarm to inform operator actions as well as executing any automatic actions. Response plans are generated from incident management templates, which can be configured for different types of alarm situations.

#### Audit Reporting Service

All CDC Server Services log audit trail information. The Audit Reporting Service queries the resultant database for management report production.

#### Grouping Service

This service is used to combine Objects from the different Server Services on a location basis. This allows, for example, Fire Objects (detectors and text messages) to be grouped into a Room and Rooms to be grouped into an Area and Areas to be grouped into a Building and so on. The Groupings are constructed to match the workstation

graphical screens hierarchy. These Graphics can be overlaid on maps to represent the status of any Group, which in turn represents the state of its sub-groups.

#### Scheduling Service

This service provides a means for scheduling actions against any of the CDC Integra Objects (e.g. turn the outside lighting on at 7pm, turn the outside lighting off at 7am).

#### User Service

A service for the storage and validation of PIN numbers and passwords for authorised system operators and administrators.

#### Web Communication Service

Manages requests for data from the CDC Integra XML Web Service. This service will obtain the data from the appropriate Server Service and will pass the data back to the Web Service.

### Additional Server Services applications available are:

#### BMS Service

Manages the interfaces with building and plant management systems for reading and writing interval data and reporting alarm conditions.

#### CCTV Service

Manages a database of cameras, camera views and monitors. The CCTV Service is able to process user-initiated actions such as pan and tilt control. The CCTV Service also reports CCTV related alarm conditions such as video loss and motion detection alarms.

#### Data Logging Service

Manages the data logging of BMS and other "point" data sources such as meters to the central database. The Service maintains information about the data points and the logging interval frequency.

#### Fire Service

Manages a database of all Detectors, Loops, Zones, Panels and fire-related text messages. It runs a continuous housekeeping function, which performs the role of both verifying the presence and state of the physical devices against the database. The Fire Service updates the database whenever it is informed by any of the Interface drivers of a change in status on any Fire Service Object. The Fire Service is also able to process operator-initiated requests to perform actions such as panel reset, evacuate and silence.

### Security Service

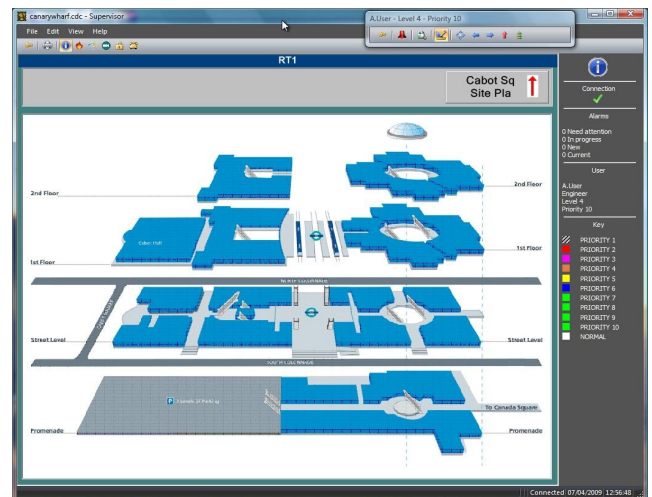
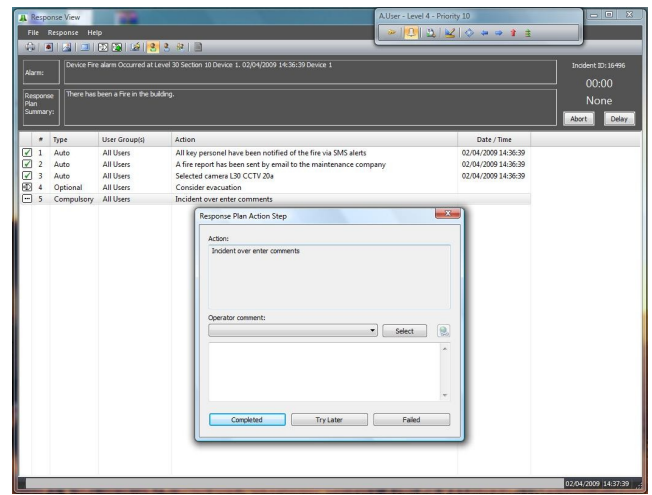
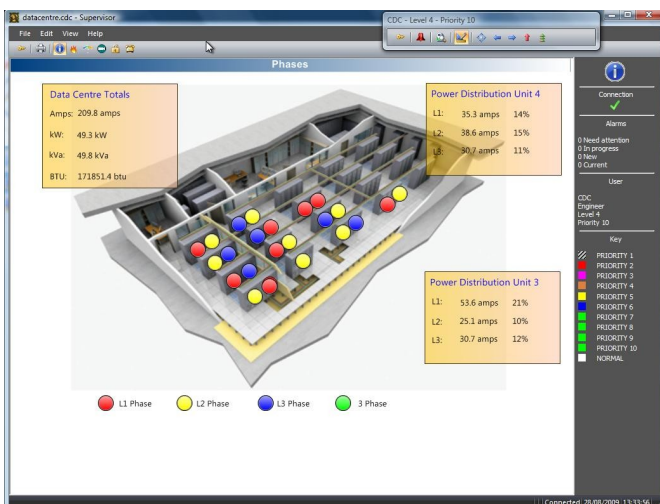
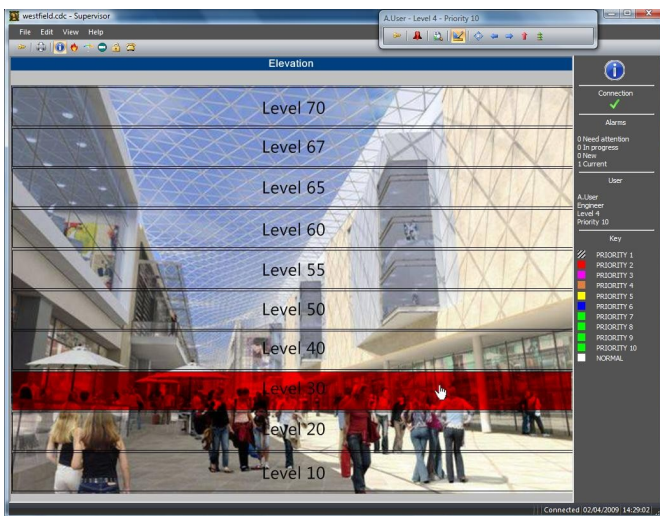
Monitors all security and access control systems such as alarm devices, card readers, door contacts and infrared detectors. The Security Service updates the database whenever it is informed by any of the Security Drivers of a change in status on any Security Service Object. The Security Service is able to process operator-initiated requests to perform actions such as device and area isolation .

### Telephony Service

Controls the interface to telephony devices such as telephones, intercom extensions and help points. Each telephony device is represented by a Phone Object. The status of Phone Objects is updated from Telephony Manager Drivers. The Service can also be configured to monitor Telephony Manager Line Objects for incoming calls and then match an incoming call to a Phone Object by caller ID. The Phone Object can then generate a 'New Call' alarm on the alarm list.

## The CDC Integra™ Graphical Supervisor

The CDC Graphical Supervisor offers a flexible workstation interface that allows communication between different manufacturers' sub-systems and presents information and control facilities to the operator in an easily comprehensible graphical format.



The Graphical Supervisor provides a graphical representation of the site, based upon a set of hierarchical map screens, with each screen providing a greater level of detail than the last. The top level represents the entire site, and the bottom the individual objects on building sub-systems and their locations.

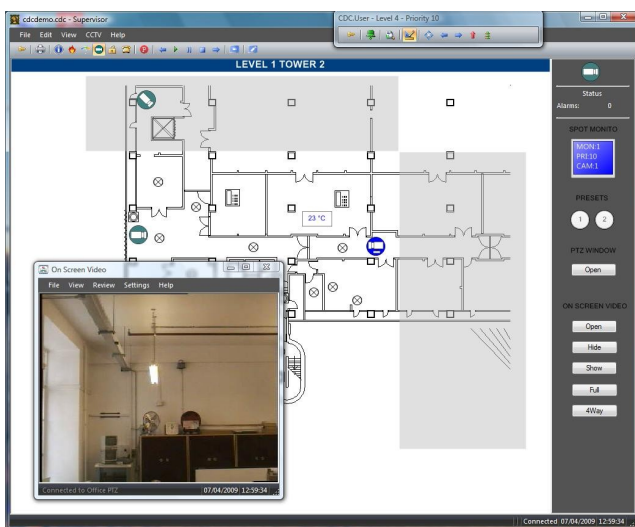
A colour-coded scheme is used to represent the priority status of any particular part of the building. The colour is overlaid on the map areas, to provide a simple visual indication as to the location of any problem.

In addition to maps and status indication, the system provides an alarm list display. Alarms in this list can be sorted by priority, status, location, or chronological order, depending upon the desired presentation.

Standard Incident Response Plans are made available for the most prevalent or important alarms. The response plan for a particular alarm can be retrieved by selecting the alarm on the graphic display.

Reports are made available and provide both audit trail information and system status information. System status reports are produced automatically on a periodic basis.

The Graphical Supervisor may be run on multiple workstations, thus allowing each workstation the appropriate controls for all the attached sub-systems. The operator is presented with concise and comprehensive on-line, real time information regarding the status of the site systems as a whole.



The workstations retrieve and run their applications from the SQL server database, which in this case also acts as a network file-server. The workstations connect to the Central Management System, and are able to register interest in any of the data held by any of the server services. Once registered, the workstations are provided with interval data whenever the server services reports a status change in the connected building sub-system.

All workstations are assumed to have access to a locally connected printer, and are thus able to print out both graphics screens and current reports. The Graphical Supervisor supports dual mouse and touch-screen controlled user interfaces. For systems incorporating CCTV, the workstation may also incorporate a joystick to control

the CCTV pan, tilt and zoom camera functions.

### The CDC Integra™ Interface Library of Satellite Communication Drivers

The CDC Integra™ Interface Library provides Satellite Communications Drivers to function on the Network Interface Unit (NIU), the hardware connected to each of the building sub-systems. The satellite communication drivers are responsible for converting read, write and alarm requests between the proprietary data formats used by the different manufacturers' sub-systems and the standard data formats used by the Central Management Server.

The satellite communication drivers are internally based on the OSI ISO Communications Model framework, and certified by sub-system manufacturers or the issuing software house where appropriate.

Satellite communication drivers are available that support the following protocol standards which provides access to many vendors systems:

- OPC OLE/COM.
- BACnet.
- Modbus.
- Echelon protocol (LON).
- TCP/IP & G802.3 or 11.
- XML data exchange.
- SNMP data exchange.
- Systems providing an ActiveX interface

Uniquely, CDC has also developed a library of satellite communications drivers for many proprietary and legacy building sub-systems; and this library is being regularly updated.

The current satellite communications driver library is available as a supplement to this document.

## The CDC Integra™ difference

The CDC Integra™ software platform hosts an integrated suite of CDC Server Services that each have a clearly defined role in terms of the discipline or function to which they relate (such as BMS, Fire, Security, CCTV etc). Each Server Service applies discipline-specific rules to maintain the integrity of the systems they control.

CDC Server Services all share the following service characteristics:

- A Grouping Service used to combine management tasks from the different Server Services on a location basis.
- The Logging and Report Generating Service provides audit trail information, and also acts as a central report storage facility.
- The Alarm Management Service receives alarms and allocates them into a prioritised Alarm List. It also builds a Response Plan for each received alarm to provide clear operator instructions.

CDC Integra™ provides two types of integration mechanisms:

- Discrete Binding between Points.
- Response Plan Actions.

When establishing CDC Integra™ for the first time, it is essential to determine the type of integration mechanism to use, what needs to be integrated and why. In most cases this results in a configuration that requires a few discrete bindings for specialised operations, and a small set of Response Plan Templates to deal with the majority of generated event or alarm conditions.

### Binding

A discrete **Binding** mechanism is established for transferring data values between building sub-systems. A typical use might be to distribute a single outside-air temperature reading to several different types of air handling unit plant. It allows for:

- values to be read from one set of points,
- logic and scaling to be applied, and the results to be written to another set of points.

The Binding Service includes logic block modules that can be used to implement decision mechanisms based on multiple input data point values. This allows interlocks between systems to be programmed, and provides the means by which complex cause and effect relationships

between separate systems can be implemented.

Bindings are usually used to perform small numbers of specialised background tasks specific to a particular building environment.

### Response Plans

The **Response Plan** method of integration is designed to analyse a large number of different alarm conditions. Each plan creates “easy to interpret and follow” instructions in response to particular alarm stimuli. The response plan can automate some response actions, and assist operators or operational managers in completing others.

Response Plans are designed to provide operations and management teams with a tried and tested operational procedure when an alarm situation occurs, and to record their actions and feedback to an audit trail.

A conventional building management application would rely on creating bindings to implement cause and effect links for each possible alarm condition. In such a system a matrix of hundreds or even thousands of links must be set up to achieve the desired cause and effect mechanism in the event of a particular type of alarm for which there may be many sources. This approach does not work well in practice, as the task is huge, prone to error, difficult to prove correct, and very difficult to maintain on a long-term basis.

The Response Plan method of integration is designed to cope with a very great number of different inputs, usually in response to an alarm condition. These may be alarm conditions from devices like fire detectors, security door contacts or PIRs, access control card readers, tagging devices, and asset monitors.

Response Plans are designed to tackle large-scale alarm management situations in a person-oriented and procedurally based manner. They are modelled on BS5979 disaster management planning techniques, and are designed to create easy to interpret and follow instructions in response to particular alarm stimuli. They also automate some response actions, and assist operators or managers in completing others.

Cause and effect implementation in alarm conditions cannot always be achieved by a totally automatic set of actions. A real-world alarm situation usually requires some operator intervention actions that cannot easily be automated, such as viewing a CCTV image to verify an alarm condition.

Response Plans are designed to include this requirement by providing operators or managers with the operational procedure for an alarm condition when it happens, and recording their actions and feedback to an audit trail.

Response Plans define three types of actions in response to a particular type of alarm condition:

- Automatic.
- Compulsory.
- Optional.

All actions can define the types of points that will be affected, the scope of the search for nearby points to the alarm location, and the data values to be recorded.

Examples of an automatic action are automated paging, release of door locks, or security lighting activation.

Automatic plans may also be used to build climate control scenarios based on time of day, energy saving or carbon reduction factors.

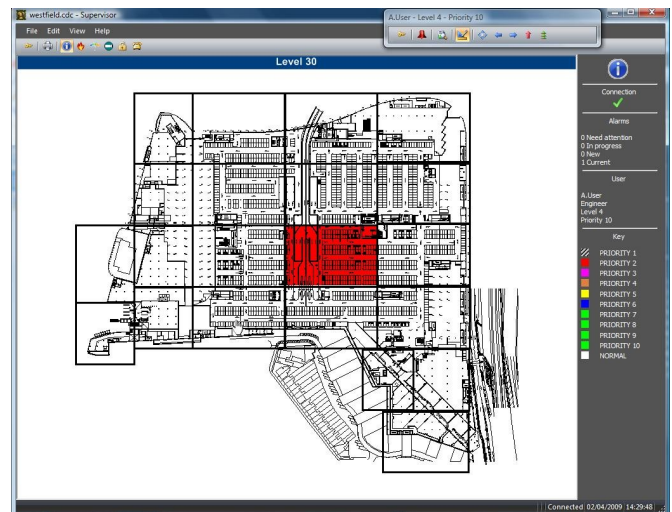
The Compulsory and Optional actions are for operators or managers, and allow for computer assisted operator actions such as telephoning response services or shutting down critical systems, where authorisation and feedback from the operator is required.

In a Response Plan based system, only one simple set of rules (called Response Plan Templates) need to be created for a building, and points assigned to the building locations by a simple 'drag and drop' process. Once assigned to a location, alarm points automatically behave according to the rules that apply to that location. Assignments of points can be easily verified, and only a small percentage needs to be tested to prove the correct operation of the system.

For example, a Fire Response Plan might be programmed to do the following:

- automatically start a specific smoke extract fan.
- automatically open a specific smoke vent.

- automatically shut down any nearby high-voltage fluorescent or neon lighting.
- optionally activate nearby security lighting.
- optionally select any nearby CCTV camera so that the alarm can be verified.



If this plan were to be assigned to the first floor of a building, then any fire detector on the first floor (regardless of how the floor is sub-divided) tripping into an alarm condition will cause the extract fan to start, the smoke vent to open, and the high voltage lighting close to the fire location to be switched off. The operator then has the option of selecting any of the nearby CCTV cameras, and enabling extra security lighting nearby to the alarm location should it be required.

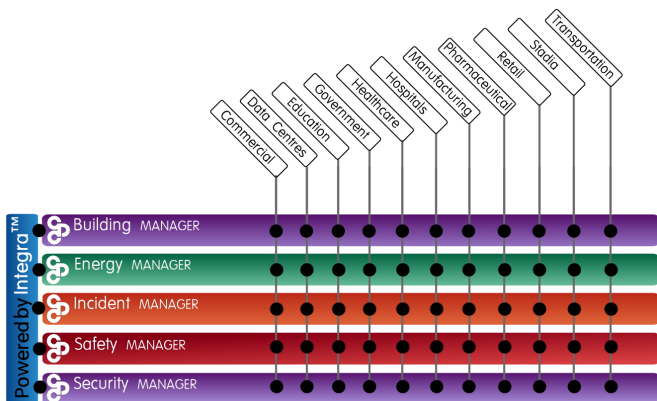
The key words in the above example are **specific** and **nearby**. The Response Plan feature allows the range of the search for nearby points of a certain type to be pre-defined, using the alarm source location as a starting point.

## Integra™ applications

The CDC Integra™ Manager applications build upon the Integra™ software platform to provide an interconnected suite of feature rich applications designed to monitor, control and group together disparate building sub-systems. The main CDC Integra™ applications are:

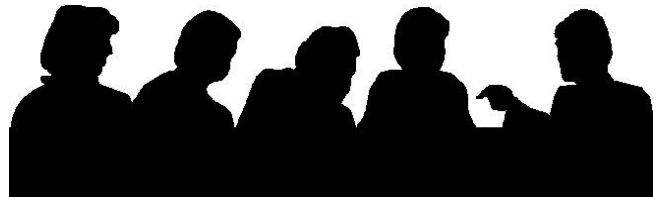
- Building Manager
- Energy Manager
- Security Manager
- Safety Manager
- Incident Manager

Additional CDC Integra™ Manager applications are also available for specific operational solutions such as Vehicle inspection & parking management and Production control & automation.



## About CDC

CDC is one of the pioneers of the intelligent buildings concept and has been a market leader since its inception in 1988. An international network of offices in London, Dubai, Istanbul and Beijing supports our activities as a leading authority in existing and new build projects.



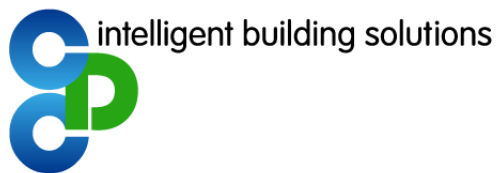
CDC solutions are used in over a 1,000 global locations and we are solution partners with many of the world-renowned organisations in the provision of intelligent building solutions.

A founder member of the Intelligent Buildings Group, CDC also continues to invest in R&D at leading universities to help drive the market and develop new technologies.

CDC provides many intelligent building management solutions covering sectors such as Healthcare & Hospitals, Retail Malls, Commercial, Industrial, Pharmaceuticals, Transportation, National & Local Government and Education.







## CDC intelligent building solutions

Riverside Building  
County Hall  
Westminster Bridge Road  
London, SE1 7PB  
United Kingdom

Telephone +44 (0)20 7928 9150  
Fax +44 (0)845 330 7267

CDC International FZ-LLC  
Executive Office #22  
Building #16  
Dubai Internet City  
Ground Floor  
PO Box 73030  
Dubai, UAE

**Email:** [sales@cdc.uk.com](mailto:sales@cdc.uk.com)

**Web:** [www.cdc.uk.com](http://www.cdc.uk.com)

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