IGIC
Cadastral, Boundaries, PLSS Workgroup

- IGIC Workgroup
  - Comments and suggestions welcome

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Science Services Branch
GIS and Engineering Section

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IGIC website:  www.igic.org

Workgroup website:
http://igic.org/committees/cadboundplss.html
IGIC Cadastral, Boundaries, PLSS Workgroup
Working with Surveying Community

Participants

- Indiana Geographic Information Council (IGIC) – federal, state, county, local, private
- Indiana Society of Professional Land Surveyors (ISPLS)
- Office of the Indiana State Geodetic Advisor
- Indiana County Surveyor’s Association
- Indiana Geological Survey
- Private Companies
Cadastral, Boundaries, PLSS Workgroup Projects

- Tie Card Project – PLSS Surveyor Tie Card Layer
- GIS County Boundary - Point, Line, and Polygon Layers
- Government Land Office (GLO) Records
  - (Federal, State, & County Records linked in GIS)
Tie Card Pilot Project

Components

• Grid Points
• Statewide Grid Point Naming Convention
• Scanned Tie Cards
• Renaming Software (need Adobe Reader)
• Database Table (Access)
  — automatically created when using Renaming Software
• Include Tie Card hyperlink in database
• Click on map hyperlink and see scanned Tie Card pop-up
• Training materials on website along with a video step by step
Tie Card Project

County Participants

• Bartholomew - E.R. Gray III, PLS
  Ray Sheldon

• Newton - Chris Knochel

• Jennings - Chad Ebinger

• Marion - Debra Jenkins
  Bryan Catlin

• Wayne - William Brown
  Shaun Scholer
The Grid Point GIS layer was computer generated using the GIS section boundary layer.

The Grid Point layer was developed as part of the Tie Card Pilot Project.

GIS allows one to click on a point and a scanned image of the tie card will pop up on the computer screen.

- Grid point layer created by Brian Wood
- Section boundary created by Indiana Geological Survey
- County boundary created by U.S. Census Bureau

Source: Brian Wood, and Census Data
Geodetic, ISPLS, HARN Workgroup
Lorraine Wright, 1/19/06
Tie Card Project

Grid Points are numbered 1-80 in each section

Approximation of ¼, ¼, ¼ corners
**Grid point representation of section and ¼ corner**

**Grid Point numbers**

(00, 04, 08, 36, 40, 44, 72, 76, 80)
Each section corner can have up to four grid points
The Grid Point description depends on which section the PLSS corner was surveyed from

Each Grid Point would have a different T R Section reference
Developed Statewide Grid Point Naming Convention

- **Grid Point File Naming Convention**
  (approximate section corner and section division corners)

  - **IN02_T23NR06E03_08**
  - State Name and Principal Meridian – **IN02**
  - Township Number – **T23**
  - Township Direction – **N**
  - Range Number – **R06**
  - Range Direction – **E**
  - Section – **03**
  - Grid Number – **08** (Grid numbering system begins with 00 in upper left hand of section and ends in 80, bottom left corner)
Tie Card Project

Developed

Renaming Software

Creates database in the background
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDname</td>
<td>Text</td>
</tr>
<tr>
<td>FileName</td>
<td>Text</td>
</tr>
<tr>
<td>County</td>
<td>Text</td>
</tr>
<tr>
<td>Owner</td>
<td>Text</td>
</tr>
<tr>
<td>Meridian</td>
<td>Number</td>
</tr>
<tr>
<td>Section</td>
<td>Number</td>
</tr>
<tr>
<td>Township</td>
<td>Text</td>
</tr>
<tr>
<td>Range</td>
<td>Text</td>
</tr>
<tr>
<td>S_M_T_R_S</td>
<td>Text</td>
</tr>
<tr>
<td>T_R_S_Name</td>
<td>Text</td>
</tr>
<tr>
<td>QuartrDesc</td>
<td>Text</td>
</tr>
<tr>
<td>PntIDNum</td>
<td>Number</td>
</tr>
<tr>
<td>LocalID</td>
<td>Text</td>
</tr>
<tr>
<td>CtlPtType</td>
<td>Text</td>
</tr>
<tr>
<td>ScanDate</td>
<td>Date/Time</td>
</tr>
<tr>
<td>ScannedBy</td>
<td>Text</td>
</tr>
</tbody>
</table>
### Renaming Software Product Output

#### Table 1:

<table>
<thead>
<tr>
<th>IDname</th>
<th>FileName</th>
<th>County</th>
<th>Owner</th>
<th>Meridian</th>
<th>Section</th>
<th>Township</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN02_T07NR04E11_18</td>
<td>IN02_T07NR04E11_18.pdf</td>
<td>Bartholomew</td>
<td>Co_Surveyor_Sec_Cors</td>
<td>2</td>
<td>11</td>
<td>07N</td>
<td>04E</td>
</tr>
</tbody>
</table>

#### Table 2:

<table>
<thead>
<tr>
<th>S M T R S</th>
<th>T R S Name</th>
<th>QuartrDesc</th>
<th>PntIDNum</th>
<th>LocalID</th>
<th>CtlPtType</th>
<th>ScanDate</th>
<th>ScannedBy</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN02T07NR04E11</td>
<td>T07NR04E11</td>
<td>SW SW¼ NW¼ NW¼</td>
<td>18 F</td>
<td></td>
<td>Horizontal</td>
<td>5/10/2005 4:02:53 PM</td>
<td>Lorraine Wright</td>
</tr>
</tbody>
</table>
Tie Card Counties
On IndianaMap
- Bartholomew
- Newton
- Jennings
- Marion
- Wayne
Bartholomew County Tie Card

SEC. 20  TWP. 9  RGE. 5

GPS #208  GRID POINT  E

Point 1st Est. by W. Hayes  BCS  Date No Date
Original Entry Section Corner Record Book
Original Monument Sand Rock

Point Recovered by C. Stottle - B. Turner
Mon. Found  3/8" Barar inside 3/4" Pipe
Mon. Set  2 x 12" Steel Pipe w/66' At. Gap over said 3/4" Pipe

Set BCS. Mon. For GPS. 1995
Ties Made and Recorded as Follows:

<table>
<thead>
<tr>
<th>STONE TIE BOOK</th>
<th>PAGE</th>
<th>DATE</th>
<th>SURVEYOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Card States Sand-</td>
<td></td>
<td>9/12/1966</td>
<td>L. White &amp; Assoc.</td>
</tr>
<tr>
<td>Stone Found: Set 3/4&quot; Pipe</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AK 11-A</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPS</td>
<td>1995</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Newton Co.
Surveyor Tie Card
Layer – Pilot Project
Marion Co.
Surveyor
Tie Card
Layer
Wayne Co.
Surveyor Tie
Card Layer
Tie Card Project: A GIS Framework Layer

Process for Combining County Tie Cards Into a Statewide GIS System

1. Developed a File Naming Convention
- Surveys describe a Public Land Survey Section corner (ex. NE ¼ corner, NE 1/4, NE1/4, Section 03, T23N, R06W)
- Counties have different names for the ¼, ¼, ¼ corners
- Needed a way to link different data together

Statewide naming convention
IN02_T23NR06E03_08
- Computer File Name will include – (example)
  - State Name and Principal Meridian – IN02
  - Township number – T23
  - Township direction – N
  - Range number – R06
  - Range direction – E
  - Section – 03
  - Grid Number – 08 (Grid numbering system begins with 00 in upper left hand of section and ends in 80, bottom right corner)

2. Developed a GRID Point GIS Layer
- The Grid Point GIS layer was computer generated using the GIS section boundary layer
- The Grid Point layer was develop as part of the Tie Card Pilot Project
- Each point is named with the statewide naming convention

3. Developed the Renaming Software
- Tie Card Renaming Software (created by Brian Wood)
- Created to enable the scanned image of the Tie Cards to be renamed with the statewide naming convention
- Creates a database of the scanned images with County name and new naming convention

4. Created a Geographic Information System (GIS) Surveyor Tie Card Layer
- Link the Grid Point layer to the database created after using the renaming software

Bartholomew County Tie Cards on IndianaMap

- Click on Grid Point and the website pops up
- Click on the website and the hyperlink pops up
- Click on the hyperlink and the Tie Card pops up

Section 35, T9N, R6E and Section 2, T8N, R6E Grid Points, Bartholomew Co

5. Scanned Tie Card
- Pops up when you click on the point

6. Scanned Tie Card
- Pops up when you click on the point

7. IndianaMap provide easy access to Surveyor Tie Card information
- Tie Card Layer includes: Bartholomew, Newton, Jennings, Marion and Wayne County data
- Available on the IndianaMap website
- GIS allows one to click on a point associated with a scanned image of the tie card and the tie card will pop up on the computer screen

8. Disclaimer added to metadata to inform the public of use restrictions

9. Easy to use IndianaMap
- Select PLSS Surveyor Tie Cards Layer
- Zoom into area of interest
- Click Grid Point on map and the web link pops-up
- Click on hyperlink and Tie Card opens
- The browse button shows several links at a time

Definition - A Tie Card is a scanned image of a County's Public Land Survey System Section Corner Description

By Lorraine Wright, IDEM, February 27, 2013,
Source: Lorraine Wright – IDEM (lwright@idem.IN.gov); IGIC Cadastral, Boundaries, PLSS Workgroup; Bartholomew, Jennings, Newton, Marion and Wayne Co Tie Cards; Brian Wood – Grid Points and Renaming Software; IndianaMap; and Indiana Geological Survey – website
GIS County Boundary Why?

• Need to match GIS data across counties by using a common boundary
  – Federal GIS data mandates (use standards)
  – State GIS data efforts to have seamless data across county boundaries
  – County 911 calls
  – Match Boundaries
    • Civil Township
    • County Boundary
    • Parcel Boundary (adjoining counties)
    • PLSS Boundaries
    • Streets
    • Other
GIS County Boundary Participants

Steve Hook
John Howe
Michael Stevenson
Bryan Catlin
Dave Estes
Shaun Scholer
Phil Worrall

Jim Milburn
Robert Muller
Jason Coyle
Ryan Swingley
Jim Sparks
Lorraine Wright
Disclaimer

Location of the points in this GIS County Boundary Layer are approximate and should not be used for surveying and are NOT APPROVED by a COUNTY SURVEYOR for surveying purposes. Contact the County Surveyor’s Office when conducting research for surveying.
County Boundary Layers

• Inventory – Different Scales
  – Census
  – Newberry
  – INDOT
  – IGS
  – 92 Individual County Boundaries
  – Southern Indiana Boundary
    • Court case, coordinates on paper, DNR created shapefile
  – Northern Indiana Boundary Retracement Survey
    • Ongoing
County Boundary

Sources for County Boundary Legal Descriptions

• Indiana laws
  – IC 36-2-1-1 - Names of counties
    Sec. 1. Indiana is divided into the ninety-two (92) counties named in this section. The boundaries of these counties existing on August 31, 1981, remain in effect until changed in the manner prescribed by section 2 of this chapter...

• County Boundaries Book
  – Legal references for county boundary descriptions
  – Published in 1933

• Newberry Library
  – History of Indiana Counties
  – Historical and current Indiana boundary shapefiles
  – Individual County Boundary Chronologies through 1981

• Individual County Surveyor Offices
Start With Legal Description

• Different Scales – needed better accuracy
• Identify GIS points and lines used to make up a county boundary beginning with corners identified in legal description
  – Counties decide what points are used for their boundary
  – Best available data
• Need to be able to change GIS boundary points if GIS data is improved
County Boundaries

• County Boundary With Point and Line Features Developed First
  – Acquire County Boundary legal descriptions
  – Identify PLSS corners and section lines that define boundary
  – County boundary template developed and available to counties
    • for documenting data collection process
  – Associate the legal information to the points
    • Best available OR Grid Points
  – Counties can use best available data to create boundary or use the Grid Points – Counties decide

• New Statewide GIS County Boundary - Polygon
  – Best available boundaries will be on IndianaMap as County Boundaries become available
County Boundary Legal Descriptions Collected
• County Boundary Changes Since 1900
  • (source Newberry Library)


  – **27 March 1979** Boundary between CLARK and WASHINGTON was redefined [no change]. (Ind. Acts 1979, 101st gen. assy., 1st reg. sess., pub. law no. 156/p. 714)

Boundary Description of Marion County, Indiana

A part of the State of Indiana, located in Townships 14, 15, 16 and 17 North and Ranges 2, 3, 4 and 5 East of the Second Principal Meridian, described as follows:

Beginning at the Northeast Corner of Section 15, Township 17 North, Range 5 East; thence south along the east line of Sections 15, 22, 27 and 34 to the Southeast Corner of Section 34, T 17 N, R 5 E; thence west along the south line of said Section 34 to the Northeast Corner of Section 3, T 16 N, R 5 E; thence south along the east line of Sections 3, 10, 15, 22, 27 and 34 to the Southeast Corner of Section 34, T 16 N, R 5 E; thence west along the south line of said Section 34 to the Northeast Corner of Section 3, T 15 N, R 5 E; thence south along the east line of Sections 3, 10, 15, 22, 27 and 34 to the Southeast Corner of Section 34, T 15 N, R 5 E; thence west along the south line of said Section 34 to the Northeast Corner of Section 3, T 14 N, R 5 E; thence south along the east line of Sections 3, 10, 15 and 22 to the Southeast Corner of Section 22, T 14 N, R 5 E; thence west along the south line of Sections 22, 21, 20 and 19 to the Southwest Corner of Section 19, T 14 N, R 5 E; thence north along the west line of said Section 19 to the Southeast Corner of Section 24, T 14 N, R 4 E; thence west along the south line of Sections 24, 23, 22, 21, 20 and 19 to the Southwest Corner of Section 19, T 14 N, R 4 E; thence south along the west line of Section 30, T 14 N, R 4 E to the Southeast Corner of Section 24, T 14 N, R 3 E; thence west along
Copy the PLSS corner references to a database

Marion County Legal Description Cont.

I, the undersigned, hereby certify the above description to be true and correct to the best of my knowledge and belief.

Jack A. Irwin, L.S.
Marion County Surveyor
Registered Land Surveyor # S0278
<table>
<thead>
<tr>
<th>County</th>
<th>Corner Description</th>
<th>GridPtCorner</th>
<th>Boundary Description Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marion</td>
<td>Northeast Corner of Section 15, Township 17 North, Range 5 East</td>
<td>IN02_T17NR05E15_08</td>
<td>beginning at</td>
</tr>
<tr>
<td>2</td>
<td>Southeast Corner of Section 34, T 17 N, R 5 E</td>
<td>IN02_T17NR05E34_80</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Northeast Corner of Section 3, T 16 N, R 5 E</td>
<td>IN02_T16NR05E03_08</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Southeast Corner of Section 34, T 15 N, R 5 E;</td>
<td>IN02_T15NR05E34_80</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Northeast Corner of Section 3, T 15 N, R 5 E;</td>
<td>IN02_T15NR05E03_08</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Southeast Corner of Section 34, T 15 N, R 5 E;</td>
<td>IN02_T15NR05E34_80</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Northeast Corner of Section 3, T 14 N, R 5 E;</td>
<td>IN02_T14NR05E03_08</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Southeast Corner of Section 22, T 14 N, R 5 E;</td>
<td>IN02_T14NR05E22_80</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Southwest Corner of Section 19, T 14 N, R 5 E;</td>
<td>IN02_T14NR05E19_72</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Southeast Corner of Section 24, T 14 N, R 4 E;</td>
<td>IN02_T14NR04E24_80</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Southwest Corner of Section 19, T 14 N, R 4 E;</td>
<td>IN02_T14NR04E19_72</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Southeast Corner of Section 24, T 14 N, R 3 E;</td>
<td>IN02_T14NR03E24_80</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Southwest Corner of Section 19, T 14 N, R 3 E;</td>
<td>IN02_T14NR03E19_72</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Southeast Corner of Section 24, T 14 N, R 2 E;</td>
<td>IN02_T14NR02E24_80</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Southwest Corner of Section 21, T 14 N, R 2 E;</td>
<td>IN02_T14NR02E21_72</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Northwest Corner of Section 4, T 14 N, R 2 E;</td>
<td>IN02_T14NR02E04_00</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Southwest Corner of Section 33, T 15 N, R 2 E;</td>
<td>IN02_T15NR02E33_72</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Northwest Corner of Section 4, T 15 N, R 2 E;</td>
<td>IN02_T15NR02E04_00</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Southwest Corner of Section 33, T 16 N, R 2 E;</td>
<td>IN02_T16NR02E33_72</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Northwest Corner of Section 4, Twp 16 N, Range 2 E</td>
<td>IN02_T16NR02E04_00</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>South Quarter Corner of Section 32, T 17 N, R 2 E;</td>
<td>IN02_T17NR02E32_76</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>North Quarter Corner of Section 17, T 17 N, R 2 E;</td>
<td>IN02_T17NR02E17_04</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Northeast Corner of Section 13, T 17 N, R 2 E;</td>
<td>IN02_T17NR02E13_08</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Northwest Corner of Section 18, T 17 N, R 3 E;</td>
<td>IN02_T17NR03E18_00</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Northeast Corner of Section 13, T 17 N, R 3 E;</td>
<td>IN02_T17NR03E13_08</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Northwest Corner of Section 18, T 17 N, R 4 E;</td>
<td>IN02_T17NR04E18_00</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Northeast Corner of Section 13, T 17 N, R 4 E;</td>
<td>IN02_T17NR04E13_08</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Northwest Corner of Section 18, T 17 N, R 5 E;</td>
<td>IN02_T17NR05E18_00</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Northeast Corner of Section 15, T 17 N, R 5 E;</td>
<td>IN02_T17NR05E15_08</td>
<td>end back in the point of beginning</td>
</tr>
<tr>
<td>30</td>
<td>Morgan South line of Hendricks County crosses Mill Creek in Section 28 Township 14 N, R 2 W</td>
<td>IN02_T17NR02E13_08</td>
<td>commencing</td>
</tr>
<tr>
<td>31</td>
<td>Morgan Congressional Township line dividing Townships 13 and 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Morgan to the principal meridian line,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Morgan two miles due north to the present Hendricks County line</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Grid point representation of corners referenced in legal descriptions that define County Boundaries:

Beginning With County Boundary Corners
(some counties may use more corners in description)

(00, 04, 08, 36, 40, 44, 72, 76, 80)
County Boundary Template Created
Marion County Boundary Lines - correlate legal description corner with section line layer

County Boundary Points - correlate the legal description corners that define the County Boundary with the Grid Points
Marion County Boundary

Table:
- Location quality
- Hyperlink to Tie Card
Noble County Super Corners:
Corners Identified in the Legal Description

Determining County Boundary:
Section Corner Grid Point Name

Determining County Boundary: Section Corner Ownership & Grid Point Names

Noble Co. Corner Found On Old Indian Treaty Boundary
Determining County Boundary:
Section Corner Grid Point Name

4 Possible Grid Point Names
IN02_T36N07E36_80
IN02_T35N07E01_09
IN02_T36N08E31_72
IN02_T35N08E06_00

Noble Co. Legal Corner.
Legal Description from IndActs_1852_Noble_County:
Northwest Corner of Section 6, Township 35 North, Range 8 East
Grid Pnt Name based on corner description:
IN02_T35N08E06_00

Noble County, IN
Determining County Boundary
Section Corner Grid Point Name

Grid Point
Corner Owned By
Noble
Determining County Boundary: Section Corner Ownership & Grid Point Names

LaGrange County Quarter Corner
Grid Pnt Name: IN02_T36NR09E32_76

Noble County Closing Quarter Corner
Grid Pnt Name: IN02_T35NR09E05_04

Corner Owned By
- LAGRANGE
- NOBLE
- IGS Grid Points

Noble County, IN
Determining County Boundary
Section Corner Ownership & Grid Pnt Names

0 0.01 0.02 0.04 Miles

Location Below

Drawn by: SJH  Printed: 2/25/2013
Determining County Boundary:
Section Corner Grid Point Name

4 Possible Grid Point Names

IN02_T35NR08E06_00   IN02_T35NR07E01_08
IN02_T36NR08E31_72   IN02_T36NR07E36_80

TWP 35 N, RNG 8 E

Noble Co. Legal Corner.

Legal Description from IndActs_1852_Noble_County: Northwest Corner of Section 8, Township 35 North, Range 8 East

Grid Pnt Name based on corner description:
IN02_T35NR08E06_00

Grid Point

Noble

Noble County, IN
Determining County Boundary
Section Corner Grid Point Name

0  20  40  60  80 Feet
Section Intersection - Four Possible Grid Point Names

St. Joseph Co.
Sec. 36, TWP 35 N, RNG 8 E

LaGrange Co
Sec. 31, TWP 36 N, RNG 8 E

Noble County
Sec. 6, TWP 35 N, RNG 8 E

IN02_T35NR07E01_08
IN02_T35NR08E06_00
IN02_T36NR07E36_80
IN02_T36NR08E31_72
Noble Co. Corner Found
On Old Indian Treaty Boundary
Legend

- Grid Pts.
- River Boundary

These are the 77 improved Grid Pts base on GPS data from Gibson County Surveyor's Office.
Legend

- State Boundary

State Boundary remains along old Wabash River channel. Current Wabash River channel shown in here. >>>

Wabash County, Illinois

White County, Illinois

Gibson County, Indiana

Posey County, Indiana
Government Land Office (GLO) Records

- Government Land Office Records
  - County: Notes and Plats
  - State: Notes and Plats
  - Federal: Notes and Plats

- Link GLO Records to Township Polygon Layer
Government Land Office Records - County - Marion County

T15N, R3E
Boundaries, Cadastral and PLSS Workgroup

- [http://www.igic.org/committees/cadboundplss.html](http://www.igic.org/committees/cadboundplss.html)

Lorraine Wright  (Chair)
Indiana Department of Environmental Management
Office of Land Quality
Science Services Branch
GIS and Engineering Section

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